

HALL & BROWN
WOOD-WORKING MACHINE CO.
ST. LOUIS. MO. U.S.A.
CATALOGUE No. 6.

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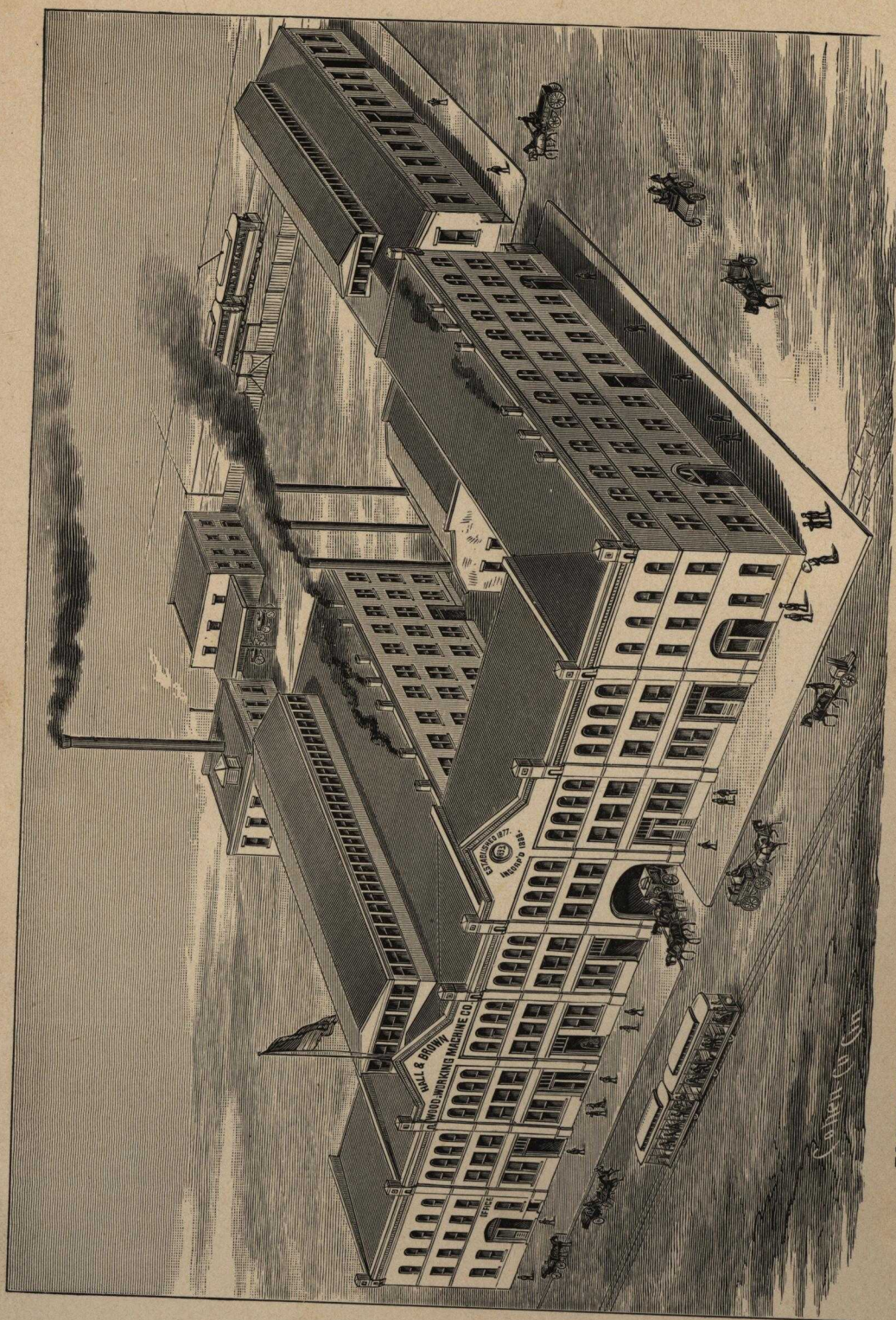
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FACTORY AND WAREHOUSES OF THE HALL & BROWN WOOD-WORKING MACHINE CO.
OFFICE, 1913 AND 1915 NORTH BROADWAY, ST. LOUIS, MO., U. S. A.

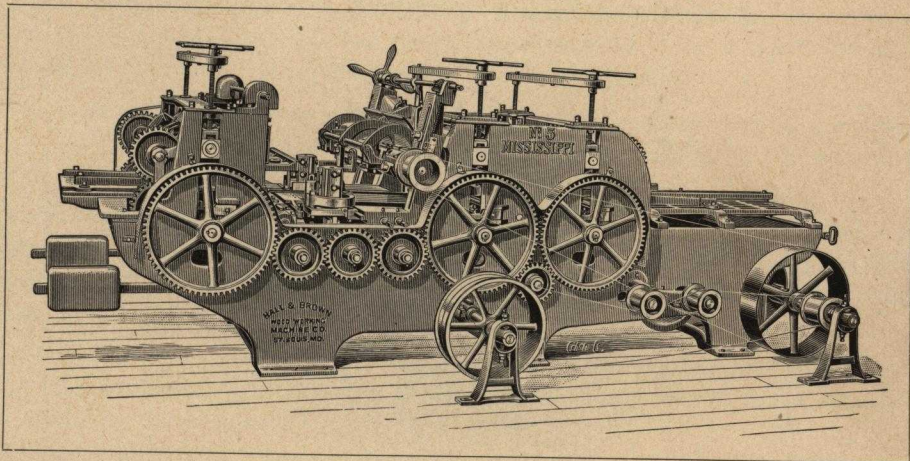
No. 6

Illustrated and Descriptive

Catalogue

OF

Patented Improved



Wood-Working Machinery

MANUFACTURED BY

Hall & Brown Wood-Working Machine Co.

1913, 1915, 1917, 1919, 1921, 1923, 1925, 1927, 1929

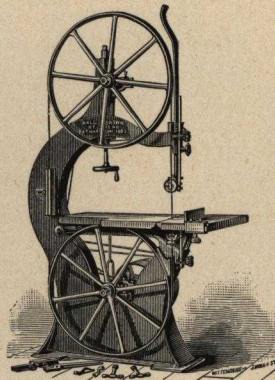
NORTH BROADWAY.

ST. LOUIS, MO., U. S. A.

No. 6 CATALOGUE.

THIS CATALOGUE SUPERCEDES ALL OTHERS.

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WRITE FOR PRICES AND DISCOUNTS.

Introductory.

It is with pleasure we again present to our friends and patrons our new illustrated Catalogue of improved Wood-Working Machinery, and desire to express our sincere thanks for the very liberal patronage extended to us in the past and shall strive to merit its continuance in the future by giving the details of the business our careful and personal attention.

Our practical experience in manufacturing this class of Machinery, dating back its commencement to 1857 gives us a thorough knowledge of the different Machines required for working wood in all its details, and also enable us to select special Machines of the very best, manufactured by other builders, having the highest reputation, thus enabling us to furnish entire outfits for Saw and Planing Mills, Door, Sash, Blind, Furniture, Box, Coffin and Chair Factories, Agricultural and Car Works; in fact everything necessary to equip a Wood Working establishment, from the Engine and Boiler down to the most minute detail.

Each department of our factory is under the supervision of competent experts, men who are accustomed to this class of work, and we have spared no expense in adapting the best methods of designing, improving and constructing our Machinery.

Since issuing our previous Catalogue we have largely increased the number of Machines we manufacture, including our celebrated Mississippi Planers and Matchers, and have discarded many old patterns, and have substituted in their places others of improved design and adaptability.

We have spared no expense in enlarging our works and increasing our facilities for the rapid and economical production of this class of Machinery, by introducing the latest and most improved Machinery for the purpose.

Our Factory, Ware-houses and other departments have a floor space of over 70,000 square feet. Our Works are lighted by electricity manufactured by ourselves, and our buildings are heated by the Smith Hot Air System.

The reputation of our Machinery throughout the United States, as well as in a large number of foreign countries, is gratifying evidence of its excellence and merits.

Each and every Machine manufactured by us is thoroughly and carefully tested on actual work before it leaves our works.

With our enlarged facilities, complete system, long experience and careful attention to the details of the business, and the reputation our Machines have acquired, we hope to merit a continuance of the patronage so liberally bestowed upon us in the past.

Strangers visiting the city who are interested in Wood-Working Machinery are cordially invited to visit us. Take the Broadway Cable Cars going North.

Soliciting your correspondence and orders, we are,

Very respectfully,

HALL & BROWN WOOD-WORKING MACHINE CO.
ST. LOUIS, MO., U. S. A.

Suggestions.

In writing to us give Post Office address in full, Town, County and State.

When writing for information please designate fully what is wanted, and if in **this** Catalogue, No. 6, refer to the page and we will quote prices and discounts by return mail.

When ordering Machinery specify distinctly what is wanted. In ordering parts for repairs describe as explicitly as possible the part or parts wanted, and when practicable return the old parts, or send tracing in order to avoid mistakes. In many cases parties will describe parts wanted as belonging to the front or back, or the right or left hand side of the Machine; operators often differ as to these parts; the order should read for the feeding in or discharging end, or the right or left hand side of the Machine as the operator stands facing the feeding in end. In ordering rolls, gears or knives for our Planers no tracing is required, if for a 4-roll Machine give the width if rolls are wanted; state whether for in or out-feeding, top or bottom, if for gears whether for in or out feeding, top or bottom, right or left hand, and if for intermediate gears so state. If Pressure Bars are wanted state plainly whether it is the receiving or discharging bars wanted. When ordering parts for our 6-roll Mississippi observe the same instructions as for the 4-roll Machine, and in addition give us the number of the Machine which will be found cast on the side of the frame. If for the middle set of rolls state whether top or bottom.

Recently we have adopted a system of numbering each piece of casting the number being cast on same, and by giving this number and advising us for what Machine the parts are wanted it will be all the information required.

In ordering gearing for other Machines, except our make, give the exact diameter, width of face, number of teeth and size of hole.

When ordering bits or knives for any other Machine except our own make, and send accurate tracing giving the length, width, thickness and position of slots, if any.

When ordering Pulleys state the diameter, width of face and exact size of bore, and whether straight face for shifting, or crown face for non-shifting belts are desired, also if cast, steel rim or wood are preferred, and if steel rim or wood split are wanted, so state.

When ordering Circular Saws state whether for ripping or cross-cutting and give the diameter, size hole and gauge. Also give the number of teeth, or the distance from point to point of teeth.

If Saw Mill Saws are wanted state whether right or left hand, give the size and distance from center to center of pin holes.

In ordering Band Saw Blades, if the Machine is our make give the diameter of wheel and width of blade wanted. If for any other make of Machine give the greatest length of the blade the Machine will carry, also width of blade wanted, and if it is desired to be brazed, set or filed.

In ordering Scroll Saw Blades specify the length, width and upon whose make of Machine they are to be used.

In ordering Mortising Chisels, if for our Machine so state giving the size wanted, if for any other make of Machine send templet, or an old Chisel Shank for size.

In ordering Machine Bits, if for our make of Machine, so state and give the size and length of twist, (we carry 4 inch twist, all sizes to fit our Machines); if for any other make of machine specify the size and length of shank, and size and length of twist. If screw shank is wanted send an old shank, or templet for thread.

In ordering endless rubber bands for Band Saw Wheels give diameter and width of face of wheel.

In ordering Planer Cylinder Heads, Moulding, Gaining or other Heads refer to pages 336 and 337 for instructions.

Prompt settlements are always required as per terms of sale. Our terms are cash except on special contracts. Remittances may be made either by Draft, Express or Money Order. Drafts should be made payable in St. Louis, or with New York Exchange.

In ordering goods please give instructions as to preferred route, and whether by Freight or Express, otherwise they will be forwarded by the cheapest and most expeditious route.

All goods delivered free on board cars or boat in St. Louis, but we cannot guarantee safe transit, after delivery at Station or to Express Company in good condition, and receiving clear receipts for same, our responsibility ends, but we will in all cases of breakage, loss or damage cheerfully assist in settlement of same.

All claims on account of errors must be made on receipt of goods.

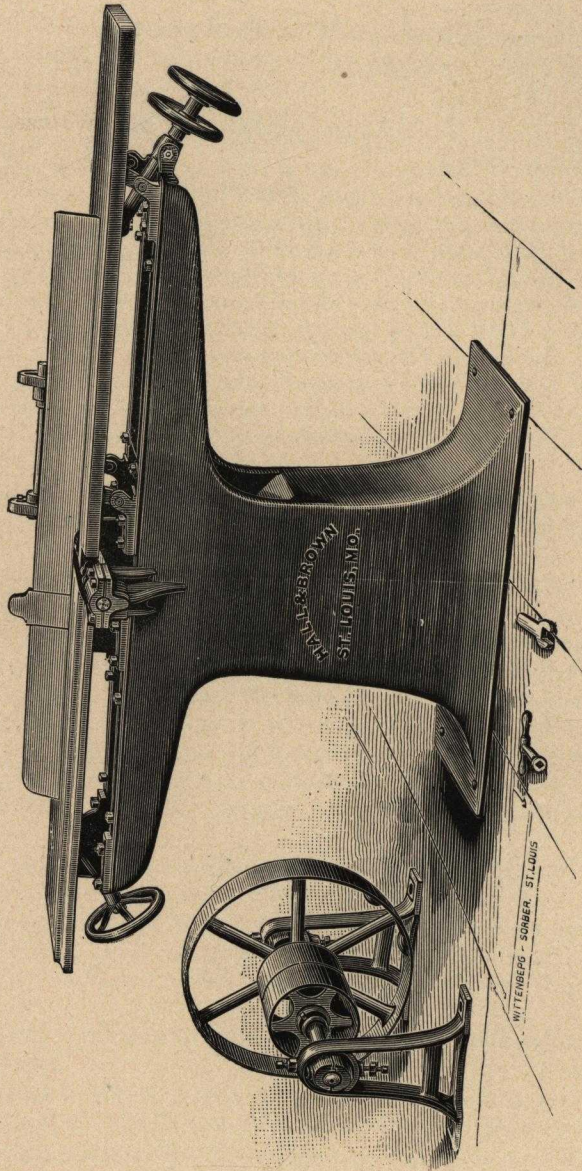
Boxing, when necessary, will be charged at cost.

Prices subject to change without notice.

By complying as near as possible with the above suggestions it will save useless correspondence, and facilitate prompt shipments.

Respectfully,

HALL & BROWN WOOD-WORKING MACHINE CO.



No. 1. 12-INCH HAND PLANER OR JOINTER.

Weight, 1140 lbs.

No. 1. 12-Inch Hand Planer or Jointer.

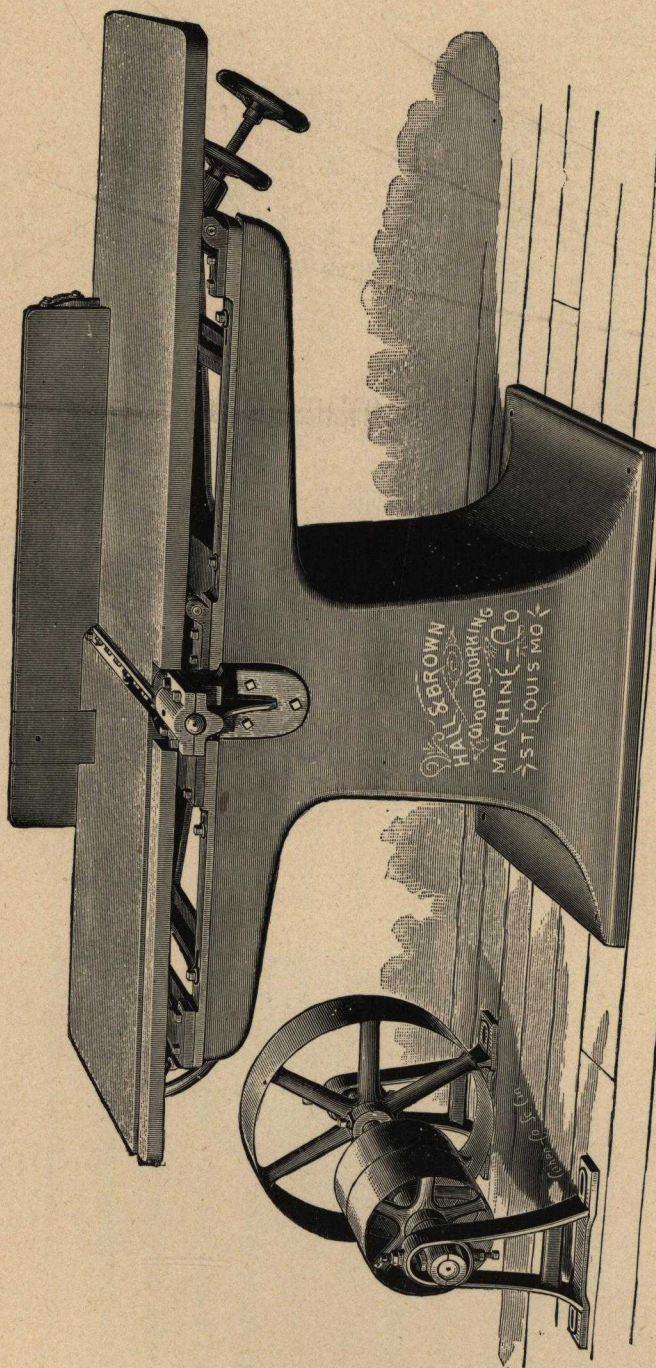
The Machine herewith illustrated, although extensively used in furniture factories, has not been adopted in one-half the manufacturing where it would be regarded as one of the greatest labor saving machines. It is adopted to a much larger range of work than might at first be supposed. It is particularly adapted to planing out of wind, jointing, beading, squaring, smoothing, rabbeting, cornering, etc. For short or light work it is superior to the Daniel's Planer for planing out of wind, as the work can be accomplished much more rapidly. The frame of the machine is heavy, and cast in one solid piece. The front and back tables are long, the two being $6\frac{1}{2}$ feet; and the knives will work 12 inches wide. The head and shaft are solid, and of forged steel. The head is small, consequently the throat between the tables is small, therefore not liable to tear out, or the ends tip down on the head while working short or cross-grain lumber. The lips of the cylinders are finished up so the knife can be brought down close for cross-grain or fine work. Each machine is provided with an adjustable gauge or rest for squaring on any kind of work to a mitre. The back table can be adjusted instantly and perfectly with the cutting edge of the knives by the hand wheel, which raises and lowers the table on a circle with the head. The front table is adjustable in the same manner by the hand wheel on the end of the machine, which gives the thickness of the cut. Each machine is furnished with counter-shaft.

The Tight and Loose Pulleys are 8 inches in diameter and $4\frac{1}{2}$ inch face and should make 750 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt from line shaft 4 inches wide, in length to suit.

Cylinder Head Belt, 3 inches wide, in length to suit from counter.



No. 4. 24-INCH HAND PLANER OR JOINTER.

Weight of 16 inch, 1250 lbs.

Weight of 20 inch, 1360 lbs.

Weight of 24 inch, 1475 lbs.

No. 4. 24-Inch Hand Planer or Jointer.

The Hand Planer or Jointer illustrated on the opposite page is similar in construction to the one illustrated and described on the two preceding pages, except that it works 24 inches wide. We also manufacture two intermediate sizes, respectively, one to work 16 inches and one to work 20 inches wide, each width Planer is of the same design but form a different set of patterns.

It will be noticed from the cut that the adjustment of the front and back tables are arranged differently. The back or rear table is simply a rest for the lumber after the cut has been taken, and only needs adjusting when the Knives are sharpened or reset upon the head, while the depth of the cut is regulated by the adjustment of the front table. The edge of the front table next to the Knives acts as a chip breaker to prevent tearing out the material when heavy cuts or cross-grained lumber is being worked. The adjustments of the front table are such that the chip breaker is carried around the circle of the head when the table is being raised or lowered, and is always the same distance from the knives regardless of the depth of cut being taken. The adjustment of either table can be made while the Machine is in motion.

We are prepared to furnish steel two or four slotted heads with either size Machine when wanted but would recommend the solid head, unless grooving, beading or moulding bits are desired to be used, as it is necessary to use a larger head when slotted which requires a wider space between the tables when in use.

Rabbetting can be done on either size Machine to a depth of $\frac{1}{2}$ inch without any special bits for the purpose.

Each Machine is furnished with a counter shaft.

Pulleys on the cylinder heads of the 20 and 24 inch Machines are $4\frac{1}{2}$ inches in diameter and 5 inch face, and should make 4,000 revolutions per minute. Pulley on cylinder head of 12 and 16 inch Machine, 4 inch diameter and $4\frac{1}{2}$ inch face, and should make 4,600 revolutions per minute.

Length of belts according to position of counter shaft.

The Tight and Loose Pulleys for the 20 and 24 inch Machines are 10 inches in diameter and 5 inch face and should make 900 revolutions per minute.

The Tight and Loose Pulleys on the 12 and 16 inch Machines are 8 inches in diameter and $4\frac{1}{2}$ inch face and should make 750 revolutions per minute.

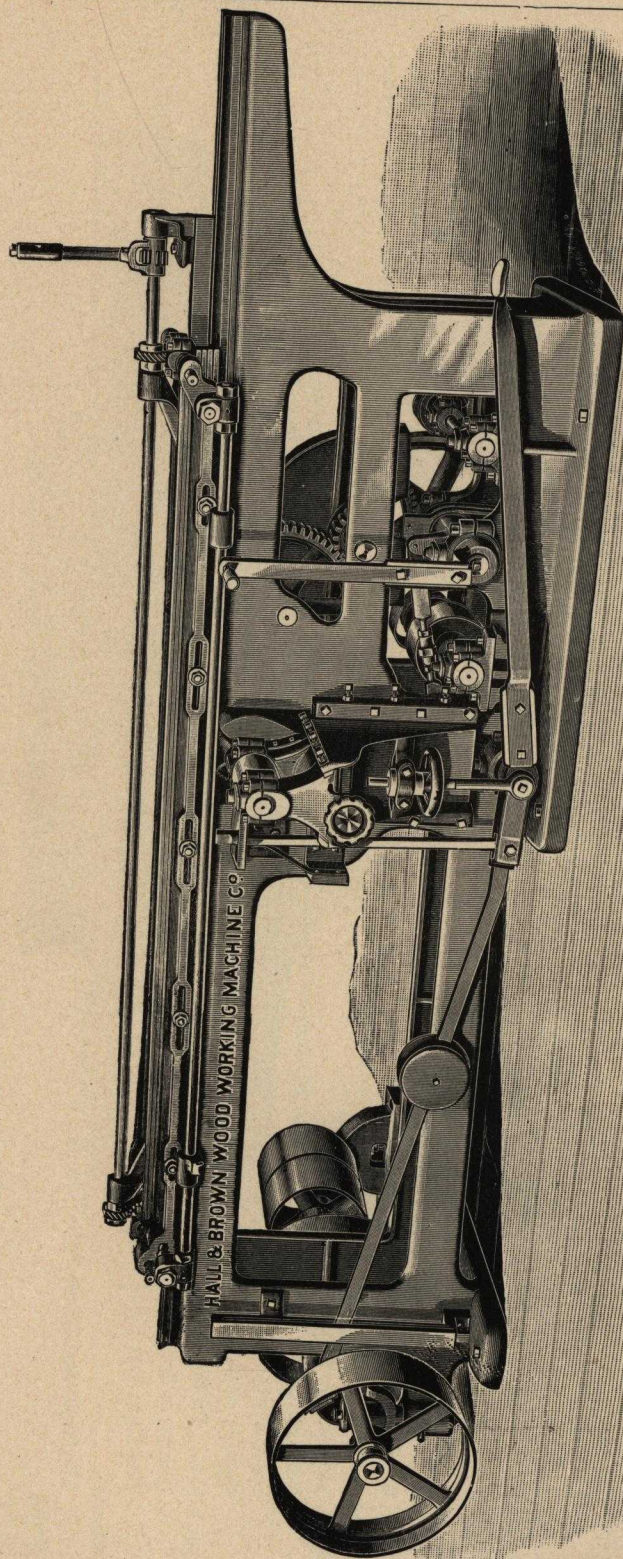
BELTS WHEN ORDERED.

Driving Belt from line shaft for 16 inch Machine, 4 inches wide, in length to suit.

Cylinder Head Belt $3\frac{1}{2}$ inches wide, in length to suit from counter.

Driving Belt from line shaft for 20 and 24 inch Machines $4\frac{1}{2}$ inches wide, in length to suit.

Cylinder Head Belt, 4 inches wide, in length to suit from counter.



GLUE JOINTER.

Weight to Joint, 6 feet 6 inches long, 2700 lbs.

Weight to Joint, 12 feet long, 4300 lbs.

Weight to Joint, 8 feet long, 3900 lbs.

Weight to Joint, 14 feet long, 4500 lbs.

Weight to Joint, 16 feet long, 4800 lbs.

Weight to Joint, 10 feet long, 4100 lbs.

GLUE JOINTER.

The cut on opposite page represents our No. 2 Glue Jointer.

The framing is made in one piece of casting, cored and ribbed internally, making it very strong to resist all strains to which it may be subjected. Counter-shaft bearings form a part of and are cast to the frame; on top of the frame is formed the perfectly true slide for carriage.

The carriage, or table, is formed of a central sliding piece and two clamping bars, fitted with a series of spring clamps. These clamping bars are adjusted automatically by means of a lever and a series of screws, and on one movement of the lever will clamp or release the work on both sides of the central carriage. Any length can be worked from 6 feet 6 inches to the very shortest piece. The variation for different thickness from 0 to 3 inches are made by the clamping lever, and no time is lost in varying the thickness of stock to be worked.

The feed is automatic in its action and is operated by an improved arrangement of gearing and friction wheels brought into operation by one treadle, when the carriage and work are passed over the cutters and automatically returned to the starting place, stopping at this point ready for the operator to take out the finished work and out in more stock. At the same instant that the carriage reverses, automatically operated by the same mechanism, the cutter-heads drop down out of the way, so that the work is not marred or the cutters dulled by the return of the carriage. The cutters are returned and locked in place by the same treadle that sets the carriage in movement. By this means the cutter will last very much longer without re-sharpening. The length of movement of the carriage is regulated by stops from a few inches to the full length of 6 feet 6 inches. The return speed of the carriage is very fast, so that the smallest possible amount of time is lost by the run back.

The cutters will not tear out from running against the grain. The saddles which carry the cutter-heads have separate vertical movement to compensate for wear of the heads, and horizontal movement to adjust the tongue and groove in the stock worked.

Tight and Loose Pulleys are 12 inches in diameter and 6 inches face and should make 600 revolutions per minute.

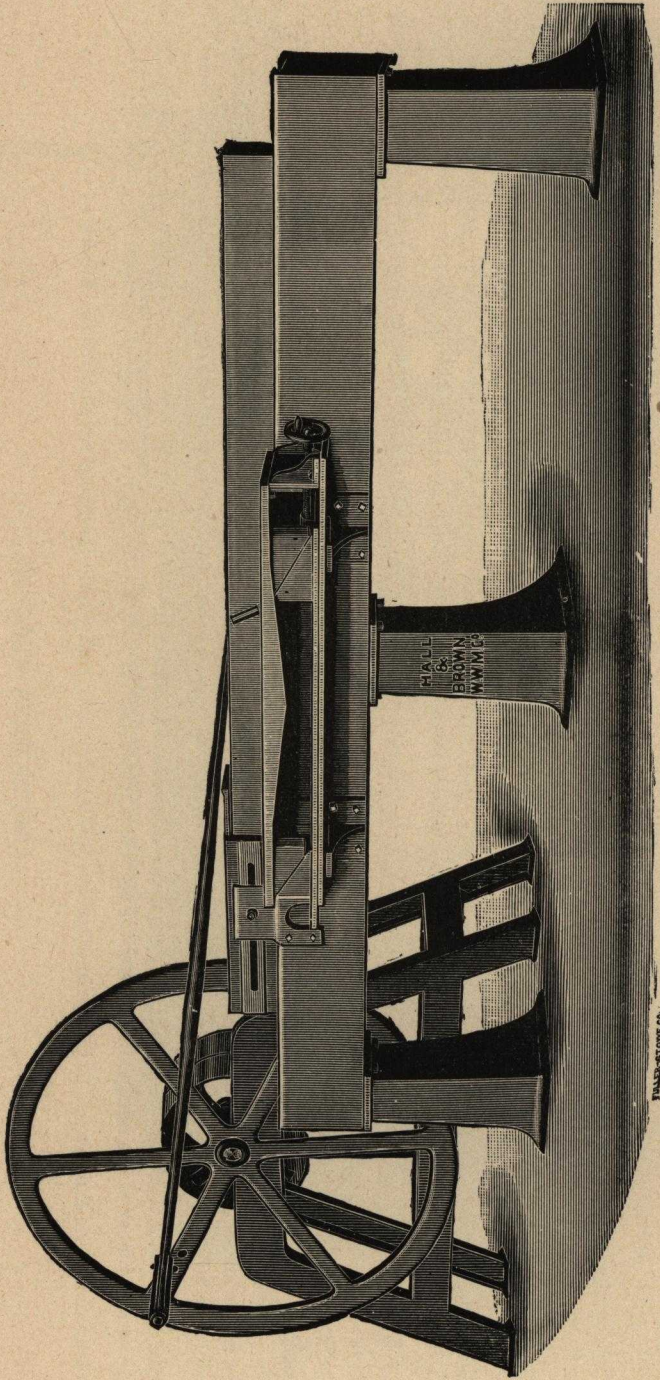
BELTS WHEN ORDERED.

Driving Belt $5\frac{1}{2}$ inches wide, in length to suit from line shaft.

Two Cutter Head Belts, 15 feet long each, 4 inches wide.

One Feed Belt, 18 feet 6 inches long, 3 inches wide.

One Reverse Feed Belt, 15 feet 3 inches long, 4 inches wide.



IMPROVED STROKE JOINTER.

Weight, 4 Inch Knife to Joint, 4 feet, 2600 Pounds.
 Weight, 4 Inch Knife to Joint, 5 feet, 2800 "
 Weight, 4 Inch Knife to Joint, 6 feet, 3000 "

Weight, 5 Inch Knife to Joint, 5 feet, 3600 Pounds.
 Weight, 5 Inch Knife to Joint, 6 feet, 3800 "
 Weight, 5 Inch Knife to Joint, 7 feet, 4000 "

Improved Stroke Jointer.

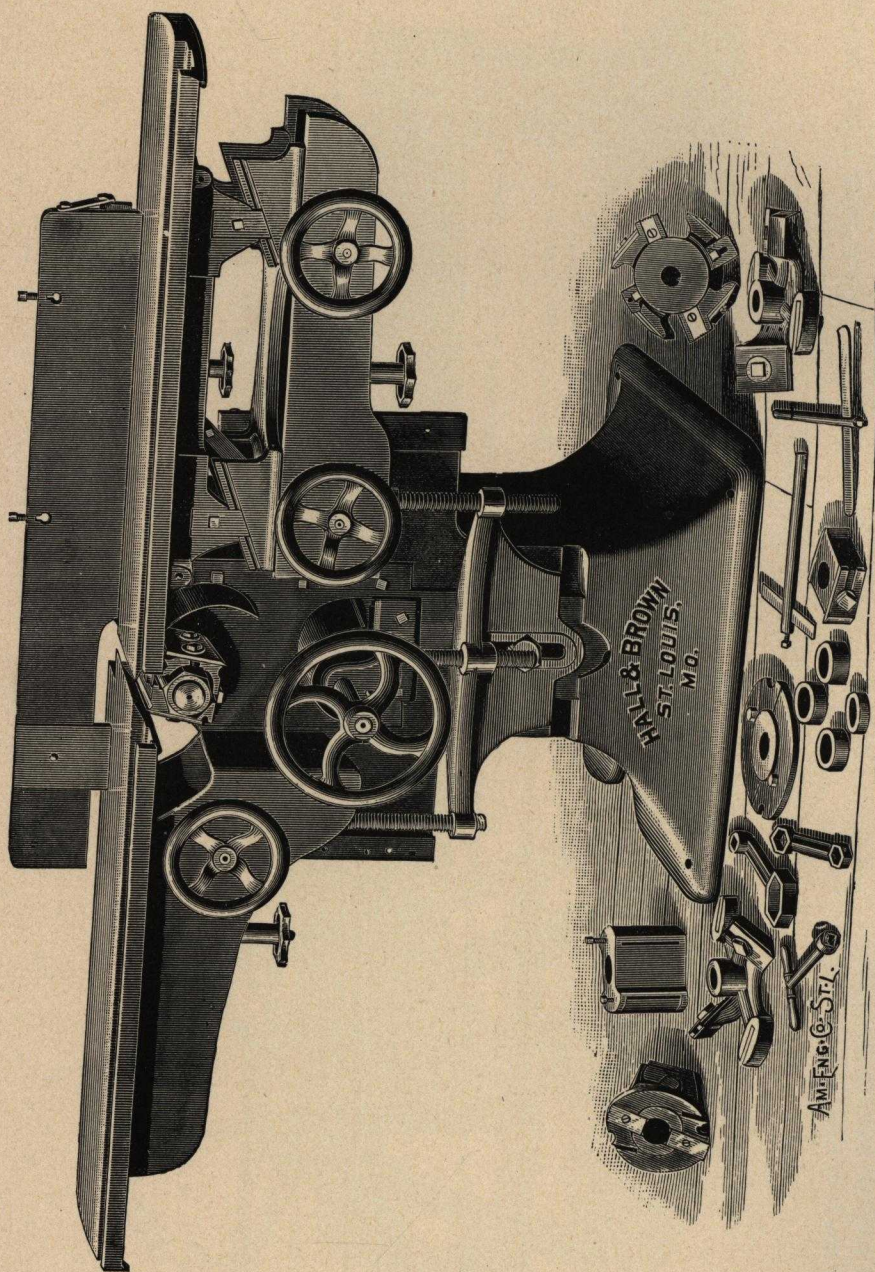
This machine is constructed from new patterns, and has all our latest improvements. The face knife is set on an incline, which enables it to do the work on cross-grained stock without eating it out. For nice glue joints or cabinet work it is particularly adapted, as it leaves a perfectly true and smooth surface, which rotary jointers do not.

Each size machine is furnished with iron frame carrying counter-shaft.

We can furnish these Machines with 4-inch knife to joint 4, 5 or 6 feet long, or with 5-inch knife to joint 5, 6 and 7 feet long, as ordered.

The Tight and Loose Pulleys are 30 inches in diameter and 5 inches face, and should make 70 revolutions per minute.

Driving Belt $4\frac{1}{2}$ inches wide, in length to suit from line shaft.



UNIVERSAL WOOD WORKER.
Weight, 1640 lbs.

Universal Wood Worker.

The frame is a square column with a broad base, which makes it convenient for setting up, as the leveling of the Machine is not dependent upon several feet or an unsteady floor, but is rigid and self supporting. The upper frame, which carries the tops, is raised and lowered on a planed way on the front of the column, by means of a screw, bevel, gears and the hand wheel shown. The front top is raised and lowered by means of the hand wheel, screw and inclines shown, the back top having no vertical motion independent of the upper frame or saddle. Both tops are adjustable horizontally and can be moved back from the head for the purpose of inserting saw boards, panel irons, etc. The arrangement of the tops is especially advantageous for some kinds of work, as after once setting the tops to the same height (as for instance in gaining, rabbeting, etc.), they may be raised or lowered for depth of cut without re-adjustment. The front part of the tops is recessed for the reception of a slide board used in gaining, and for other boards used to fill the gap between the tops, when it is necessary to have a continuous top.

The Mandrel is large and made of the best steel. The bearings, two in number, are of extra length, and are filled with the best of babbit metal of our own make, and are carefully scraped down to secure a good wearing surface.

No outside bearing is required on account of the strength of the mandrel and the length of the bearings, so that the mandrel overhangs, thus allowing heads to be changed by simply removing the nut on the end.

With the Straight Head and knives planing out of wind 8 inches wide, jointing, squaring, smoothing, beveling, cornering, chamfering, tapering and mitering can all be done without any additional fixtures, and the work will be of the finest and most accurate character.

With a special Rabbeting head, and a rabbeting iron to form a bridge over the gap between the tables, rabbeting may be done of any depth and of any width up to 5 or 6 inches. By adding a jointer head in front of the rabbeting head, blinds may be rabbeted and joined at one operation.

Heads can be used to form tenons as well as a Tenoning machine will form them, of any thickness up to 4 inches.

Hand Matching requires a special head with tongue or groove bits, and any shape of material can be matched. Two heads can be used on the same mandrel, one for tongueing, and the other for grooving, a fence being placed between them.

In Gaining, a special head is used. They are so made that they will cut any width up to twice their normal width, thus a $\frac{1}{2}$ -inch head will cut up to one inch by the insertion of standard washers. The only change required in the Machine is to remove the fence and put on a sliding gaining frame made for the purpose, with a suitable stop to determine the position of the gain. Several gaining heads may be used side by side if desired.

In addition to the kinds of work mentioned above, fluting, beading, sawing and moulding may be done, and circular, oval and elliptical moulding can be made very nicely and easily. All of our cutter heads are made to do smooth work, especial pains being taken with the bits for this purpose.

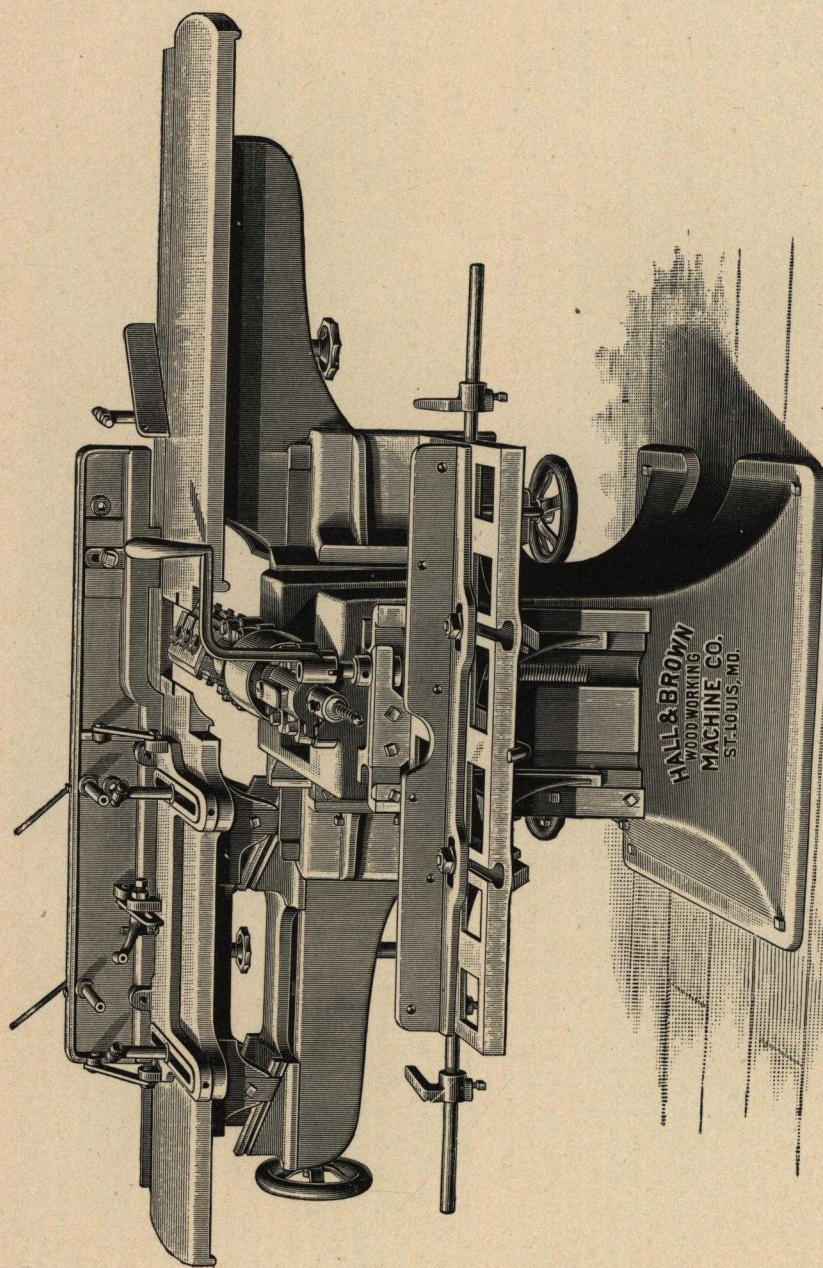
This style of Wood Worker is built, when so ordered, with a Boring and Routing table on the opposite side, thus forming an excellent Boring Machine. Two men can work on the opposite sides of the Machine without interfering with each other to any great extent, the Boring table, etc., being entirely independent of the Wood Worker, the mandrel only being used. The Boring table is especially adapted to a variety of boring; is easily raised and lowered by means of the hand wheel at the bottom. The mandrel is bored out to receive the shanks of machine augers, but a chuck can be used for holding the augers, and is useful when brace bits are used.

We furnish each Machine with a combined adjustable fence, bevel rest, gaining frame, saw frame, and one 8-inch steel 4-slotted combination head with straight knives.

We furnish no special heads except upon special orders, as every line of business requires different kinds and sizes. For different heads refer to page 336. Neither do we furnish boring and routing table unless ordered.

The mandrel pulley is 5 inches in diameter and $5\frac{1}{2}$ inch face, and should make 3,600 revolutions per minute.

When counter shaft is ordered, unless otherwise advised, we shall furnish it with tight and loose pulleys 10 inches in diameter and $5\frac{1}{2}$ inches face with 20 inch driver which should make 900 revolutions per minute.



UNIVERSAL WOOD WORKER.

Representing Boring Attachment. Weight, 1,800 lbs.

Universal Woodworker.

Boring and Routing Side.

The Machine illustrated on the opposite page is the same Machine as illustrated and described on the two preceding pages only it represents the Boring and Routing Side.

The Boring Side of the Machine can be used for all kinds of boring or routing, independent of the planing and jointing side. The Boring and Routing Table being raised or lowered independently by means of the crank shown in cut.

The table is provided with a gauge or fence which can be placed at any angle on the table and provided with stops for spacing the holes when routing or boring.

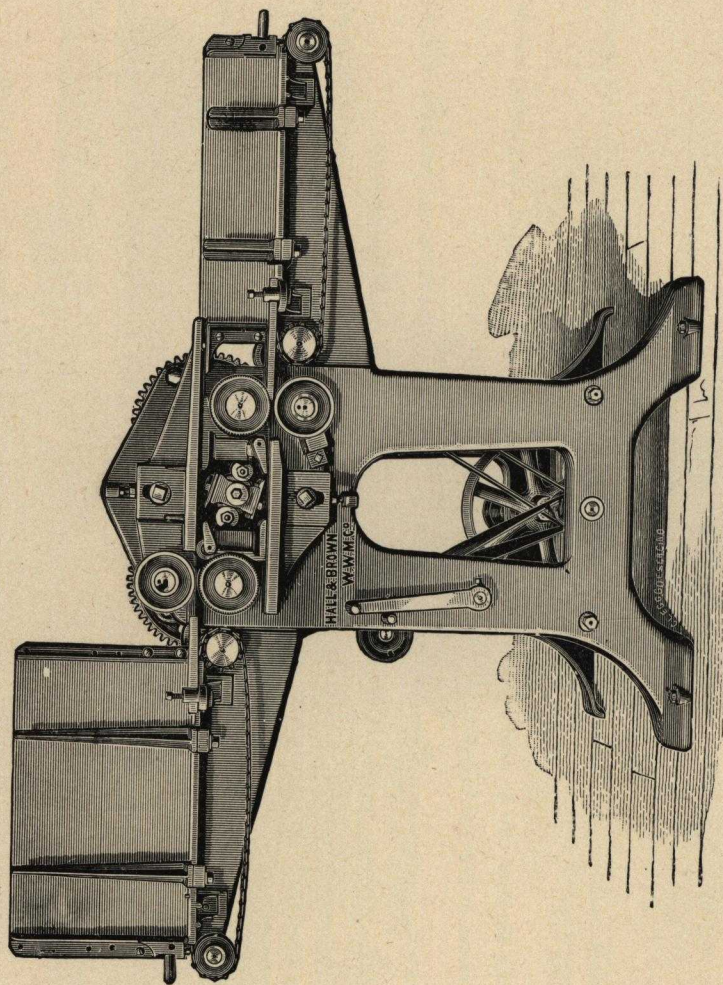
The advantage of this Combination with the Woodworker will be readily understood and appreciated by those who are short of floor space by having both Machines combined in one, thereby enabling two men to work on opposite sides of the Machine without interfering with each other.

The Mandrel is bored out to receive a regular Machine bit with $\frac{1}{2}$ inch straight shank but a Universal Chuck can be applied if desired to hold any size shank.

We furnish one 8 inch four slotted Steel Combination Head and straight knives with each Machine; no special heads or bits are furnished, except on special orders, as every line of business requires different kinds and sizes. For extra heads or bits refer to our Special Lists of Heads and bits on pages 336 and 372 of this Catalogue.

The Mandrel Pulley is 5 inches in diameter and $5\frac{1}{2}$ inch face and should make 3,600 revolutions per minute.

When counter shaft is ordered, unless otherwise advised, we will furnish it with Tight and Loose Pulleys, 10 inches in diameter, $5\frac{1}{2}$ inch face with 20 inch driver, which should make 900 revolutions per minute.



No. 1. BLIND SLAT PLANER.

Weight, 750 lbs.

No. 1. Blind Slat Planer.

Herewith we illustrate the new Single Head, Automatic Feed, Blind Slat Planer manufactured by us. These Machines are made either with or without Automatic Feed, and are the simplest and most satisfactory Machine ever invented for the purpose.

The illustration represents the Machine as constructed with the Automatic Feed.

When Hand Feed is used tables take the place of the hoppers.

The Automatic Feed is exceedingly simple and perfect in its operation. Slats to be planed are first cut in lengths, which may vary from 12 to 18 inches; these slats are placed in the entering hopper (the high hopper to the left), care being taken that each slat is grained, *i. e.*, laid so that the cut is with the grain. The hopper is filled, and should be kept full continually. After starting the cutter and feed rolls, allowing them to attain their proper speed, the bolt which is at the end of the hopper is withdrawn and the feeding begins; as the slats pass over the head they are finished on the underside and partly finished on each edge and are dropped into the delivering hopper; when the hopper is about three-fourths full the bolt which is at the end is withdrawn and the slats are then fed under the head which completes the operation, dropping them out of the Machine, finished complete. It is necessary to cut slats into lengths not to exceed 18 inches in order to feed them automatically, but slats of any length may be fed by hand through the hoppers by simply leaving off the belts which drive the automatic feed and lifting the bolts so as to leave a clear passage through the hoppers. In the hand feed Machine slats of any length may be fed, but each slat must be fed with the same edge to the guide in each passage.

The head and knives are constructed especially for the purpose and consist of the head proper, two facing knives and four edging knives. The facing knives contain the shape of the slat and it is only necessary in sharpening to grind or file them to proper bevel.

The edging bits are made to cut the edge of the slat either round or flat as may be desired. Both the facing and edging knives are easily kept in order as they both contain the shape of the slat, and sharpening requires no great skill or time. A gauge is furnished to set the knives on the head.

The automatic feed is such that slats are fed continuously, there being no space between the ends. Slats should be sawed within a fraction of their finished thickness.

The Machine can be belted from above or from below, or from either end, and complete comprises counter shaft, one head with knives for any size or shape of slat desired, gauge for setting knives on head, two endless belts for driving the Automatic Feed, and the necessary wrenches. There are three feeds, 15, 20 and 30 feet per minute.

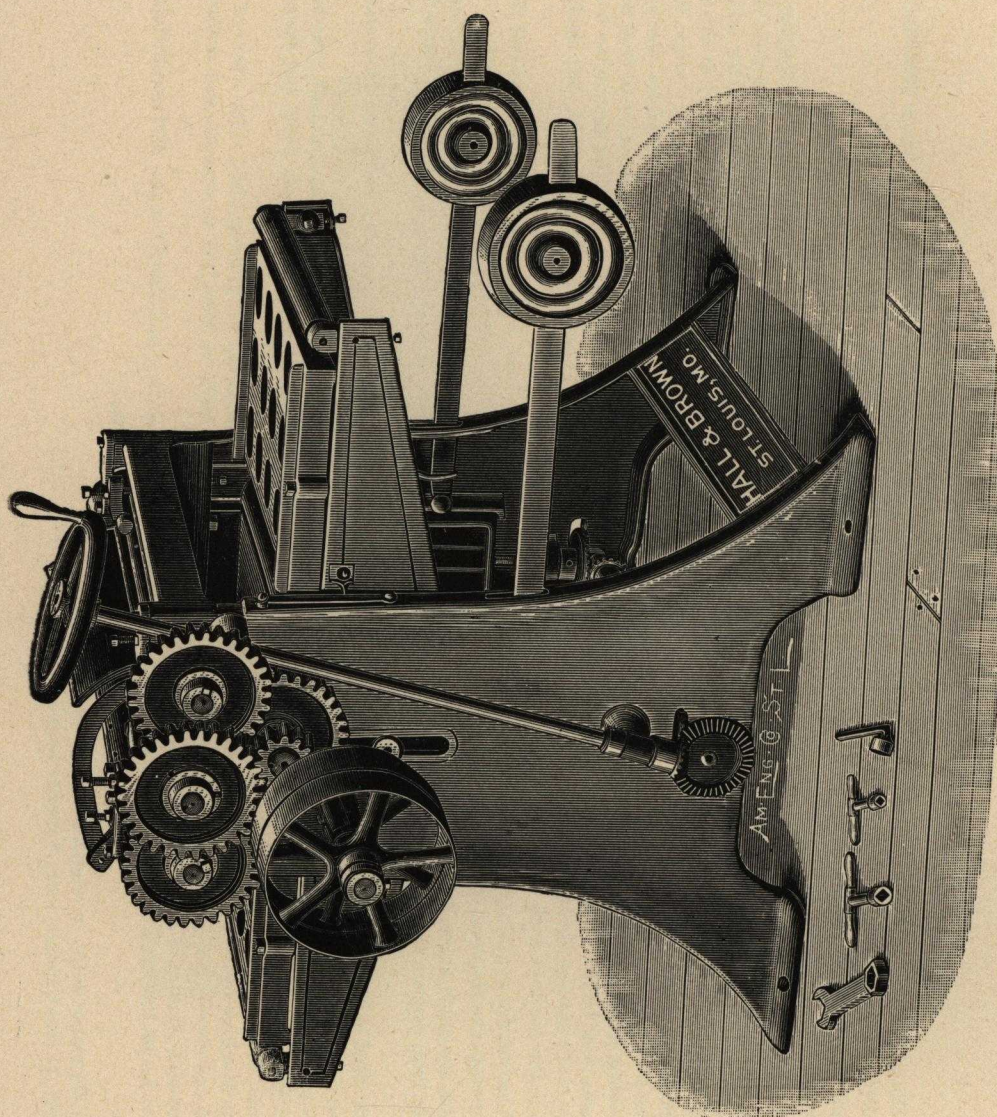
We claim this Machine to be the simplest and most economical Machine ever invented for planing blind slats either of hard or soft wood. It is well designed and carefully constructed. Its first cost is less. It costs less to belt; it costs less to operate and maintain, and it will do more work than any slat planing machine ever offered to the trade.

The Tight and Loose Pulleys on counter shaft are 6 inches in diameter by 4 inch face and should make 1000 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 3½ inches wide, in length to suit from line shaft.

One Feed Belt, 11 feet 6 inches long, 2 inches wide.



No. 2. 20-INCH PONY OR PANEL PLANER.

Weight, 1450 lbs.

No. 2. 20-Inch Pony or Panel Planer.

The machine illustrated on opposite page represents our new improved 20-inch Pony or Panel Planer, for Panels, Cigar Box, Patterns, Furniture and general Planing Mill work.

The machine is built in the very best possible manner, from the best material. It is heavy and the iron well distributed where most needed, and is really a large Planer on a small scale, it is adapted to so great a variety of work.

While it will plane six inches in thickness it will also plane down to less than one-sixteenth of an inch, and as short as four inches, without clipping the ends of the material. The cylinder is made the same as all our cylinders, solid forged steel, with the bearings and head forged in one piece, fitted with steel bolts. For without a well made cylinder, properly balanced, strong feed and suitable pressure bars, for holding the lumber, a planer can never do good work.

The Shaving Hood is so arranged as to prevent the shavings from passing under the smooth roll and marking the lumber after being planed.

The machine is provided with a pressure bar on each side of the cylinder, to prevent clipping the ends of lumber and to hold firm short thin stuff in passing the cylinder. The front pressure bar is self-adjusting, being pivoted and always regulating itself to the various and unequal thicknesses of the lumber to be worked.

In selecting a planer for general use, a machine with a positive, strong and powerful feed should be sought, so it will adapt itself to the great unequal thicknesses of sawed lumber. The front roll should be weighted as shown in cut. Oil will soon destroy the life of rubber springs and they must be continually replaced, while steel springs are liable to weaken or set under the strain of the great inequalities in thickness of lumber.

The feed is driven from the counter-shaft to a tight and loose pulley on the side of the machine. The counter-shaft can be placed either above or below or on the floor as desired.

The machine can be started or stopped, the bed raised or lowered and the thickness of the lumber to be dressed noted by the index, without the operator changing his position.

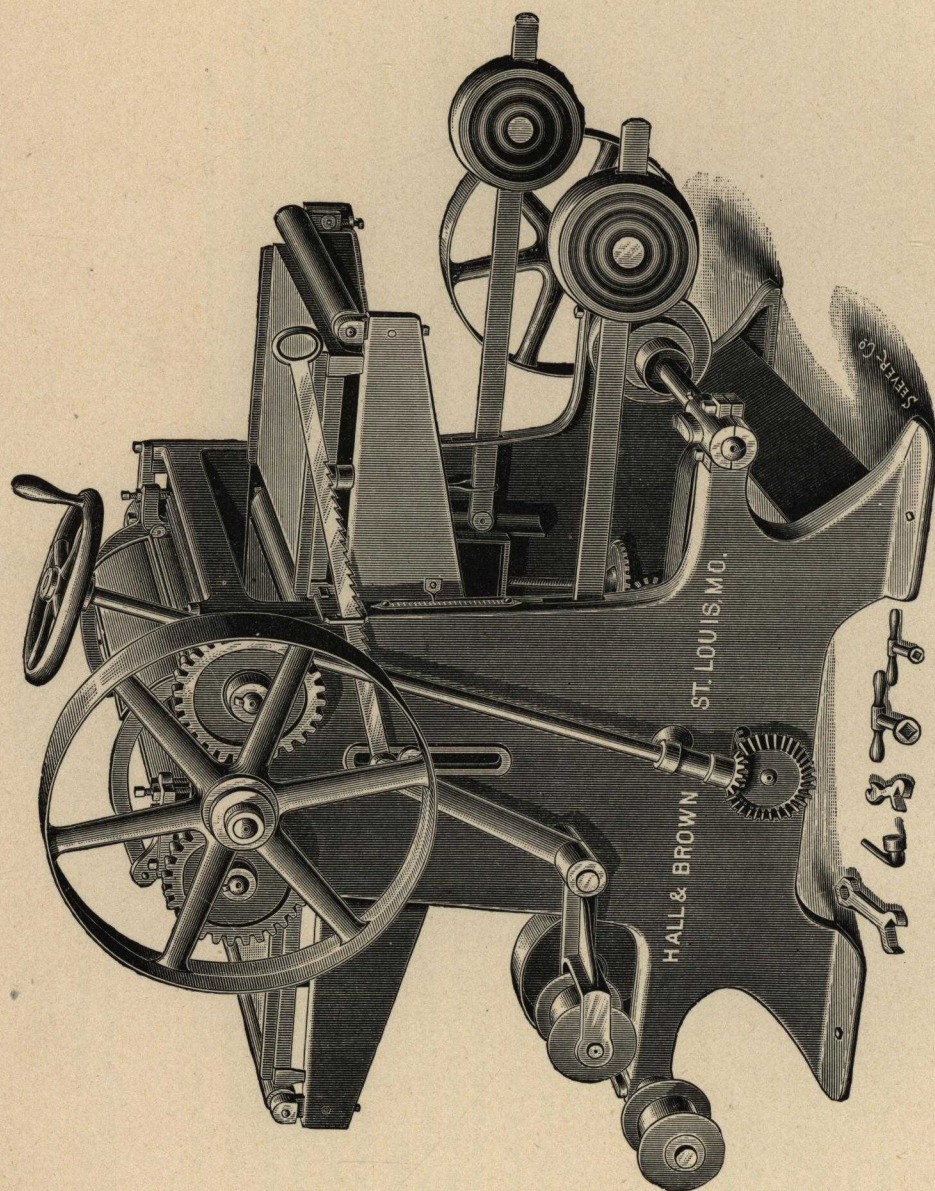
The bolt heads are all square and the operator has free access to them, with suitable wrenches furnished for the purpose.

The Tight and Loose Pulleys are 10 inches in diameter and 6-inch face, and should make 900 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt 5½ inches wide, in length to suit from line shaft.

One Feed Belt in length to suit from counter shaft.



No. 3. 24-INCH FINISHING PLANER.

Weight, 1530 lbs.

No. 3. 24-Inch Finishing Planer.

This is our new Improved Smoothing or Finishing Planer can be substituted in many cases for two machines, having a large capacity and taking little room, and for doing good work as a replaner or finisher for hard wood, short or thin stuff, it is unsurpassed, and is specially adapted to the wants of Carriage, Furniture, Chair Factories, Planing Mills, etc.

The Machine has a cone feed of three changes, and will plane from one-sixteenth of an inch up to 8 inches in thickness and 24 inches wide, and as short as 4 inches in length, without clipping the ends of the stuff. Great care has been taken to make this Planer the best Machine of the kind known, and we will warrant it second to none in the market.

The Cylinder is steel forged, shaft and all in one piece, and fitted with steel bolts for holding the knives. The Journals are large and run in boxes lined with the best genuine Babbitt metal.

A tightener is used instead of a clutch for starting and stopping the feed, and the table is raised and lowered from the same side of the Machine, also the index for getting the desired thickness of the lumber to be dressed, thus avoiding the necessity of passing round the Machine in making the necessary adjustments.

It is provided with two pressure bars, one on each side of the cylinder, both being easy of access and adjustable, which secures it against clipping the ends of the work and planing as thin as the finest veneer. The receiving pressure bar or chip-breaker is pivoted, and can be swung over clear of the head to give free access to replace or adjust the knives. It has a strong, powerful feed with heavy gearing, the front rolls being weighted.

The Machine is built in the most thorough workmanlike manner; the bolts are all square heads, and the operator has free access to the bolt heads with suitable wrenches furnished for the purpose.

Tight and Loose Pulleys are 10 inches in diameter and 5½-inch face and should make 900 revolutions per minute.

BELTS WHEN ORDERED.

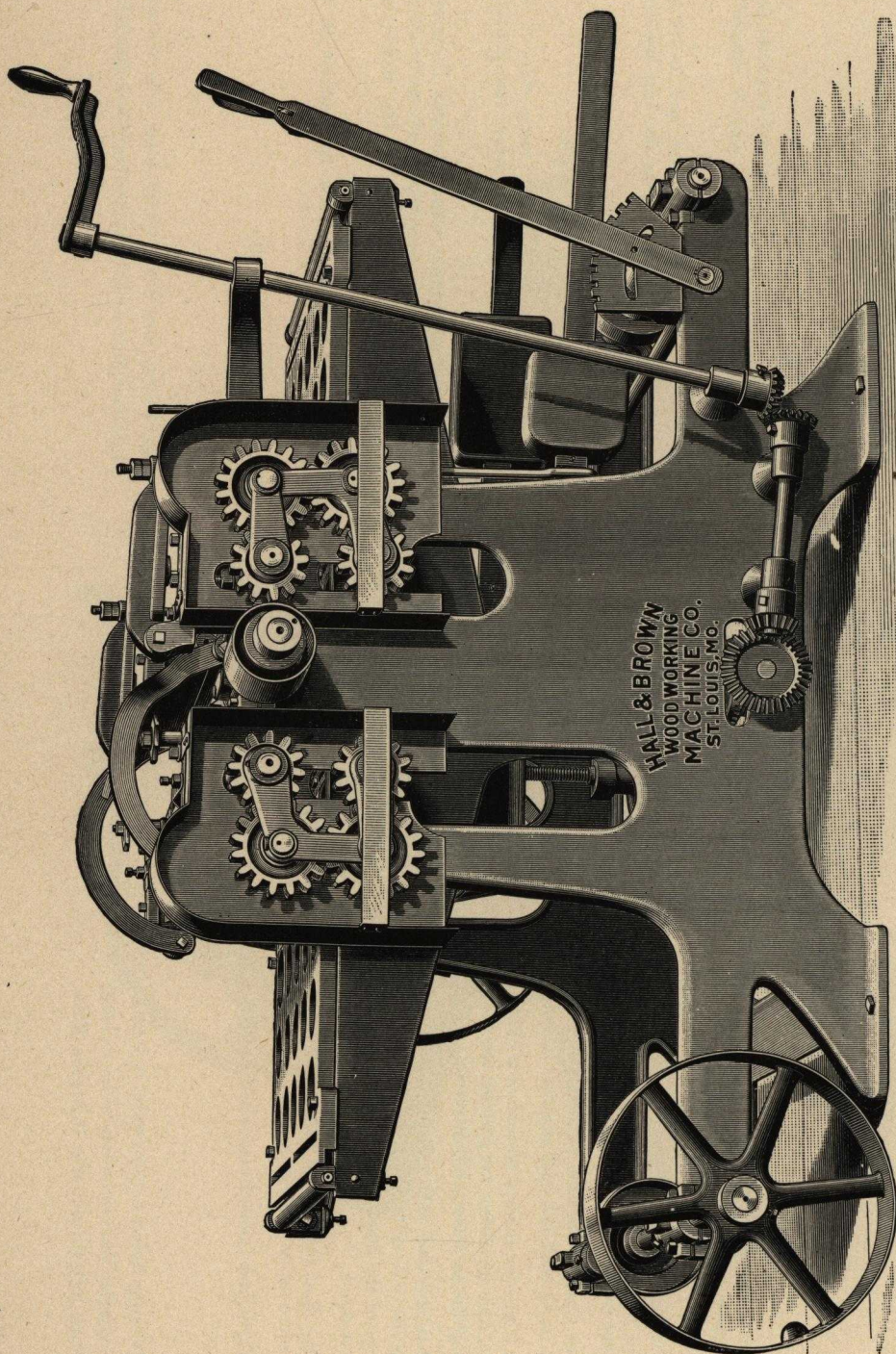
Driving Belt 5 inches wide, in length to suit from line shaft.

Cylinder Belt 4½ inches wide, in length to suit from counter.

Feed Belt 8 feet long, 1½ inches wide.

Cone Pulley Belt 8 feet 1-inch long, 2 inches wide.

Tightener Belt 8 feet 8 inches long, 3 inches wide.

*AMENGE CO.***No. 4. 24 INCH CARRIAGE PLANER.****Weight as a Single Surfacers, 2500 lbs.**

No. 4. 24 Inch Carriage Planer.

This Machine has been designed expressly for a hard-wood Planer for short or thin lumber, narrow or square material, and will be found very convenient for wagon or agricultural works, and many other establishments where the material to be planed is principally short and with narrow feeding surface.

The feed rolls are large size and strongly geared, all four rolls being driven.

The cylinder head is made of a solid steel forging, head and shaft forged in one piece, and carries two knives, but can be made with four knives if desired, and is belted at both ends.

The feed is driven direct from the cylinder head.

The Machine has a cone feed of three changes, and will plane from one-eighth up to six inches in thickness and twenty-four inches wide, and as short as six inches in length without clipping the ends, the lumber being firmly held down each side of the cylinder by pressure bars placed for the purpose.

The receiving pressure bar or chip breaker is pivoted, and can be swung over clear of the head to give free access to replace or adjust the knives.

A tightener is used to start or stop, and the table is raised and lowered from the same side of the Machine, also the index for getting the desired thickness of the material to be dressed, thus avoiding the necessity of passing around the Machine to make the necessary adjustments.

We furnish the Machine complete with counter shaft, which is not shown in cut.

The Tight and Loose pulleys are 10 inches in diameter and $6\frac{1}{4}$ inches face, and should make 900 revolutions per minute.

BELTS FOR SINGLE SURFACER WHEN ORDERED.

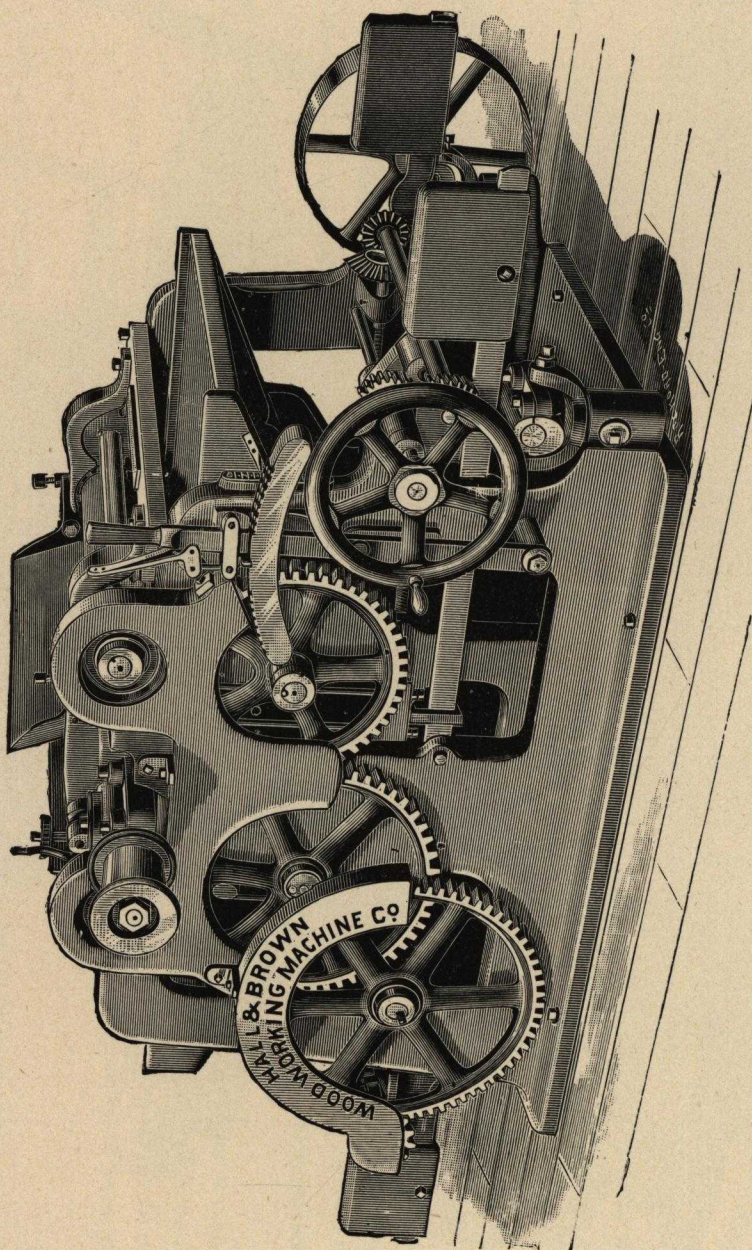
Driving Belt 6 inches wide, in length to suit from line shaft.

Two Cylinder Belts in length to suit from counter shaft, $4\frac{1}{2}$ inches wide.

One Feed Belt 9 feet 5 inches long, 3 inches wide.

One Feed Belt 12 feet 8 inches long, 2 inches wide.

One Feed Belt 9 feet 2 inches long, 2 inches wide.



No. 5. IMPROVED SINGLE CABINET FINISHING PLANER.

Weight of 24 Inch, 5100 lbs. Weight of 27 Inch, 5300 lbs. Weight of 30 Inch, 5500 lbs.
Weight of 36 Inch, 5900 lbs. Weight of 42 Inch, 6300 lbs.

No. 5. Improved Cabinet Finishing Planer.

Made to Single Surface 24-27-30-36 and 42 Inches Wide.

The machine herewith presented embodies all the requisites for finishing work used in Cabinet and Furniture making. House finish and all other classes requiring a smooth, clean surface, leaving little or no labor to prepare it for the varnish room.

Is made very heavy in all its parts, and is especially heavy and strong in and around the cutting cylinder, to take up all vibrations from high speed, and constant hammer of the knives.

The framing is cored, of a form to withstand any strain it may be subjected to.

The cutting cylinder is made of the finest tool steel, with journals 2 inch diameter and 10 inch long, forged from one block, is made with lip or cap to form double irons, for fine setting of cutters. To insure smooth work in cross-grained lumber, the journals are ground perfectly round, and run in self-oiling bearings. The cylinder is belted at both ends, thereby equalizing the strain on the journals.

Feed Rollers, four in number, are 6 inches in diameter, running in adjustable bearings, and are all driven by our improved system of gearing, in which the first or feeding in roller is so driven as to always keep in gear, whatever the inequality of the cut. The lower rollers are journaled in the bed, and raise and lower with it. The upper rollers are both weighted.

The Table is supported on and adjusted by long inclines, moved by two screws operated by the hand wheel at side of machines.

Our Self-Adjusting Spring Pressure Bar is so constructed as to yield to the cross as well as the longitudinal inequality of the lumber, thereby holding it firmly on the table, and as close to the cutters as possible, ensuring the surest possible cut.

Two speeds of feed are constantly under control of the operator, and are both worked by one lever, shown on side of machine. This same lever also starts and stops the feed; i. e.;—when the lever is standing in a vertical position, the feed stops; when the lever is moved toward the feeding-out end of the machine, the fast feed is put in operation; when it is moved toward the feeding-in end, the slow feed is in use. In the majority of work the fast feed would be used to the greatest advantage, and the quality of work be the finest, if a ready way was offered to slow up on a knotty or cross-grained spot in the material when reached; with our new patented arrangement this can be accomplished and the imperfect grain or spot in the lumber passed under the Cutter Head by the slow feed, after which the fast feed can be instantly brought into work again, thus very largely increasing the capacity of the machine in the finest class of work.

The feed Belts are inside of the machine under the table, and are brought to their work by tightener pulley, thus taking all clutches off the machine. The pulleys on cylinders are 4½ inches in diameter with 5-inch face and should make 4,000 revolutions per minute. The machine will work lumber from 1-16 inch to 6 inches in thickness.

Is built in the most thorough manner and no expense spared in material or workmanship to make it the very best.

Tight and Loose Pulleys are 12 inches in diameter and 6 inch face, and should make 750 revolutions per minute.

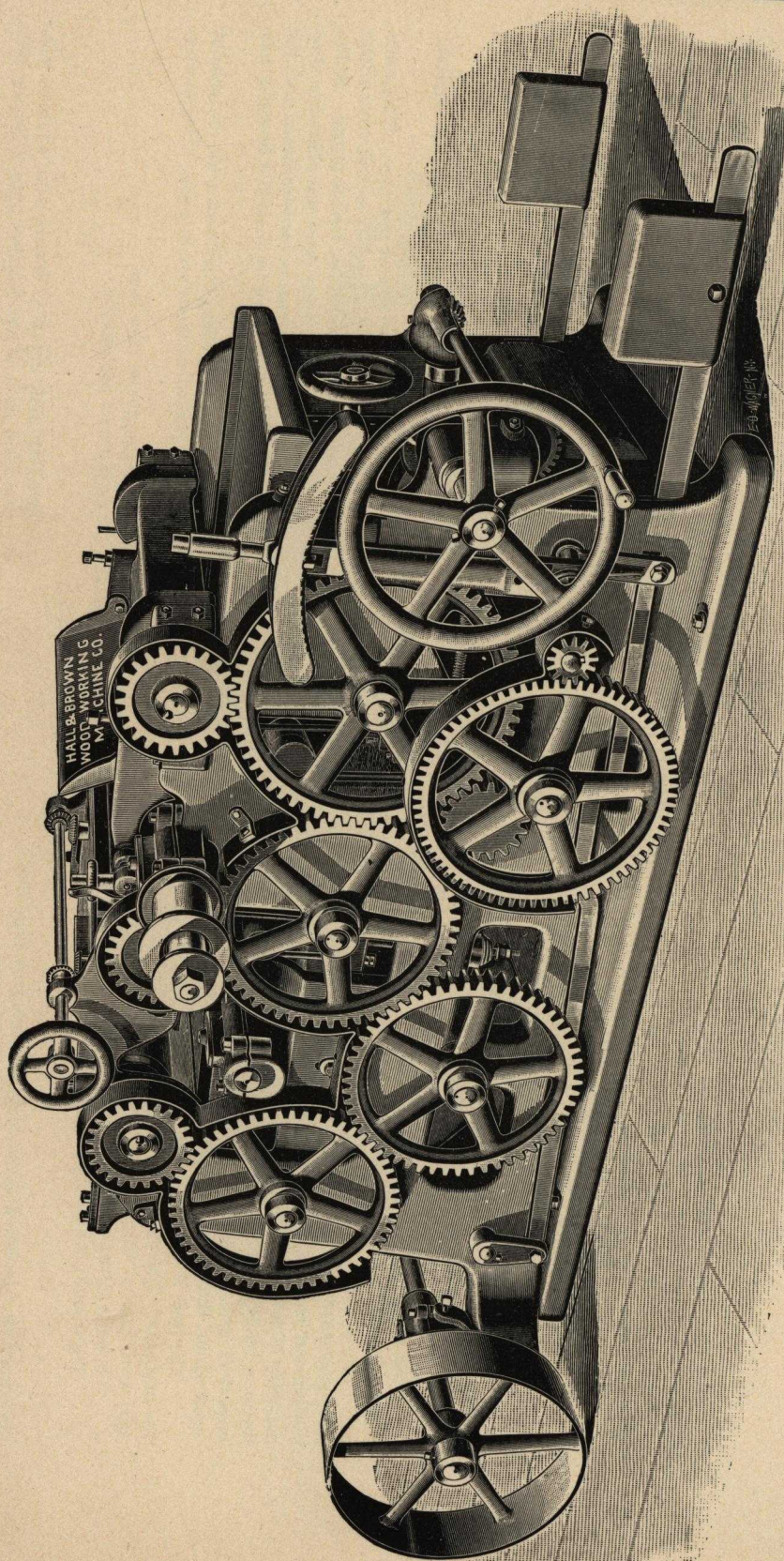
BELTS WHEN ORDERED.

Driving Belt 6 inches wide, in length to suit from Line Shaft.

One Feed Belt 9 feet 9 inches long, 3 inches wide.

One Feed Belt 12 feet 11 inches long, 4 inches wide.

One Feed Belt 13 feet 3 inches long, 4 inches wide.



No. 6. IMPROVED DOUBLE CABINET FINISHING PLANER.

Weight of 24 Inch, 7,000 lbs. Weight of 27 Inch, 7,500 lbs. Weight of 30 Inch, 8,000 lbs. Weight of 36 Inch, 9,000 lbs. Weight of 42 Inch, 10,000 lbs.

No. 6. Improved Double Cabinet Finishing Planer.

Made to Double Surface, 24, 27, 30, 36 and 42 inches Wide.

The Machine illustrated on opposite page embodies all the latest improvements for finishing on both sides of all kinds of fine woods used in furniture, Cabinet and all other classes of work requiring a smooth, clear surface, leaving little or no labor to prepare it for oil or varnish.

The Machine is made very heavy in all its parts and is especially heavy in and around the cutting cylinders to take up all vibration from high speeds, and constant hammer of the knives.

The frame is cored of a form to withstand all strain it may be subjected to, and has cast to it, suitable slide ways for the wedges and inclines supporting the table. The long inclines of the table are moved by two screws operated by a hand wheel at the side of the Machine.

The under cutter cylinder housing is nicely fitted into extra long slide ways cast to the side of the table, is adjusted with the table and also has separate vertical adjustment by means of the small hand wheels at the front end of the Machine. The object of this arrangement is to allow the operator to either double or single surface without having to loosen set screws, or to move from his position at the front of the Machine as a few turns of the small hand wheel will bring the under cylinder into operation or drop it below the table.

The feeding rollers are six in number, 6 inches in diameter, are all driven by a powerful and positive train of gearing perfectly fitted and meshed. The rollers, after the cut are all protected by scrapers to prevent chips or shavings from marring the work.

The cutting cylinders are made of the finest tool steel, with journals 2 inch in diameter, 10 inches long, forged from one block. The journals are ground perfectly true, and the cutter block made with lip or cap to form double irons, insuring smooth work in cross-grained lumber.

Our self-adjusting Spring Pressure Bar before the cut of top cylinder is so constructed as to yield to the cross as well as the longitudinal inequality of the lumber.

The pressure plate over the bottom cylinder has separate vertical adjustment, and is hinged at one end to throw back out of the way, giving easy access to the cutting cylinder for sharpening or setting of knives.

The two speeds of feed on the Machine are constantly under the control of the operator, and are both worked by one lever shown on the side of the Machine. This same lever also stops and starts the feed. The feed belts are inside of the Machine under the table, and are brought to their work by tightener Pulley, thus taking all clutches off the Machine. The Machine will work from 1-16 inch to 6 inches in thickness, is built in the most thorough manner and no expense spared in material or workmanship to make it the very best double surfacer on the market.

Tight and loose Pulleys are 14 inches in diameter and 8 inch face, and should make 750 revolutions per minute.

BELTS WHEN ORDERED.

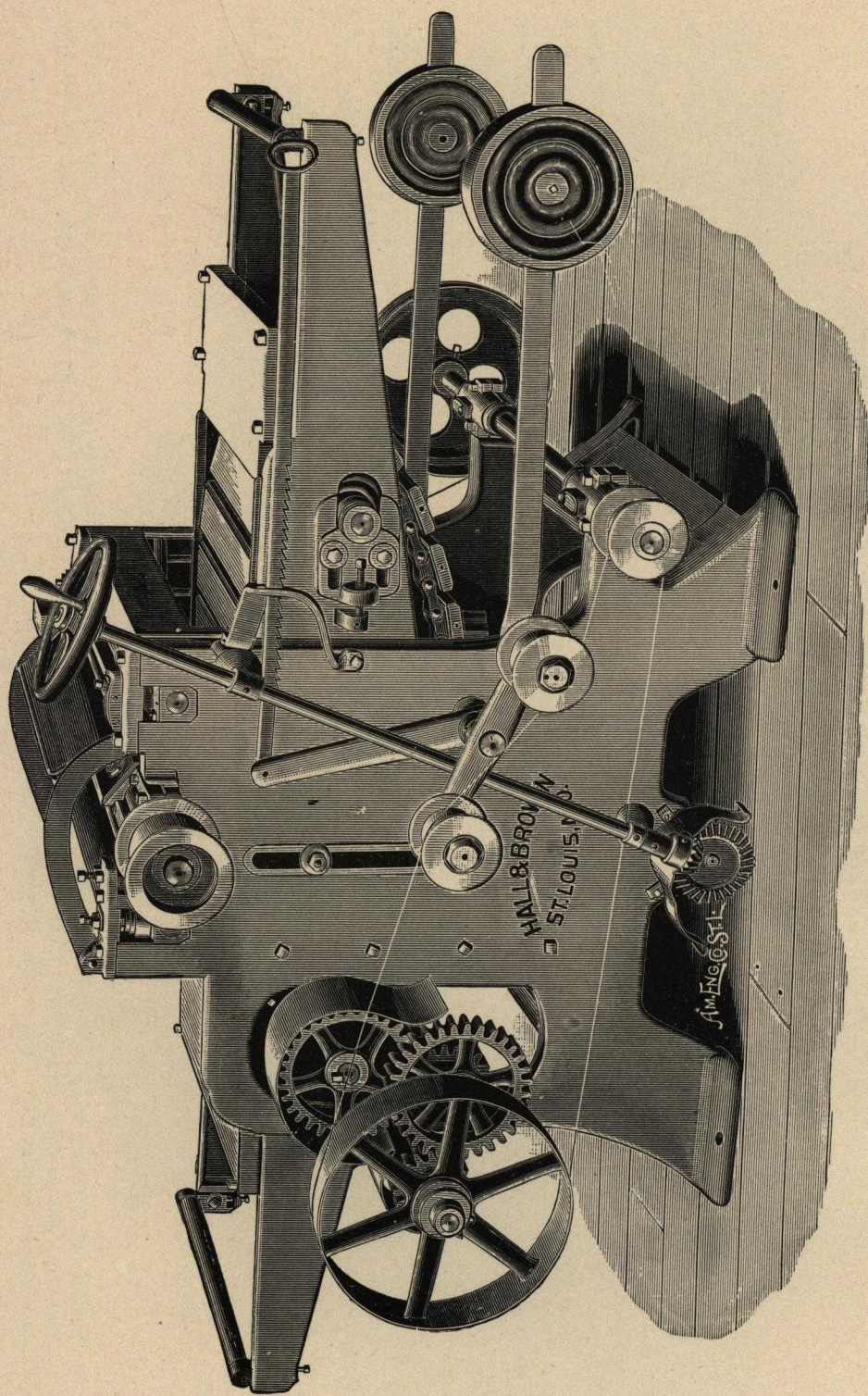
Driving belt 7½ inches wide, in length to suit from line shaft.

Two Top Cylinder Belts, 4 inches wide, in length to suit from counter shaft.

One Bottom Cylinder Belt, 4 inches wide, in length to suit from counter shaft.

Two Feed Belts, 14 feet 6 inches long, each 4 inches wide.

One Feed Belt, 11 feet 2 inches long, each 2 inches wide.



No. 1. 24 INCH ENDLESS BED SINGLE SURFACER.

Weight 3300 Pounds.

No. 1. 24 inch Endless Bed Single Surfacers.

The cut on opposite page represents our Improved Endless Bed Single Surfacers, having a powerful and rapid feed, and is a well built, substantial machine, and capable of doing a large amount of work, and is specially adapted to planing wet or icy lumber, and embodies all the latest desirable improvements.

The Cutting Cylinder and Journals are of Solid Steel, forged together in one piece. The Head carries three Knives and is double belted, with double flanged pulleys. The Journals are large and run in wide boxes, lined with the best Babbitt metal, with large reservoir for lubricating.

Special attention has been given in the construction of the Endless Apron or Slats and the Bed Plates, over which the Apron passes, which has, heretofore, been the chief cause of complaint with this kind of a machine. The lags or slats are made heavy and ribbed in the centre, having only two extreme end bearings, the Bed-Plate, over which slats pass, being faced with steel, which prevents wear. The carriers for the Endless Apron are large size, and the plain carrier roll flanged to prevent the Apron or Slats crowding to the side of machine. The pressure rolls are large and fitted in adjustable boxes, the front roll being weighted, which is superior to springs to adapt itself to extreme variations in lumber.

The back pressure roll is held by flat Steel Spiral Springs.

The machine is provided with two pressure bars, one each side of the Cylinder, both easy of access and adjustable, which secures it against clipping the ends of the work. The receiving pressure bar or chip breaker is pivoted, and can be swung clear of the head, to give clear access to replace or adjust the knives.

A tightener is used for starting and stopping the feed, and the bed is raised or lowered by a hand-wheel from the same side of the machine; also, the index for getting the desired thickness of the lumber to be dressed, thus avoiding the necessity of passing around the machine to make the necessary adjustments.

The machine is built in the most thorough workmanlike manner, the bolts are all square heads, and the operator has free access to the bolt-heads with suitable wrenches furnished for the purpose.

Tight and Loose Pulleys are 12 inches in diameter and 8½ inch face and should make 900 revolutions per minute.

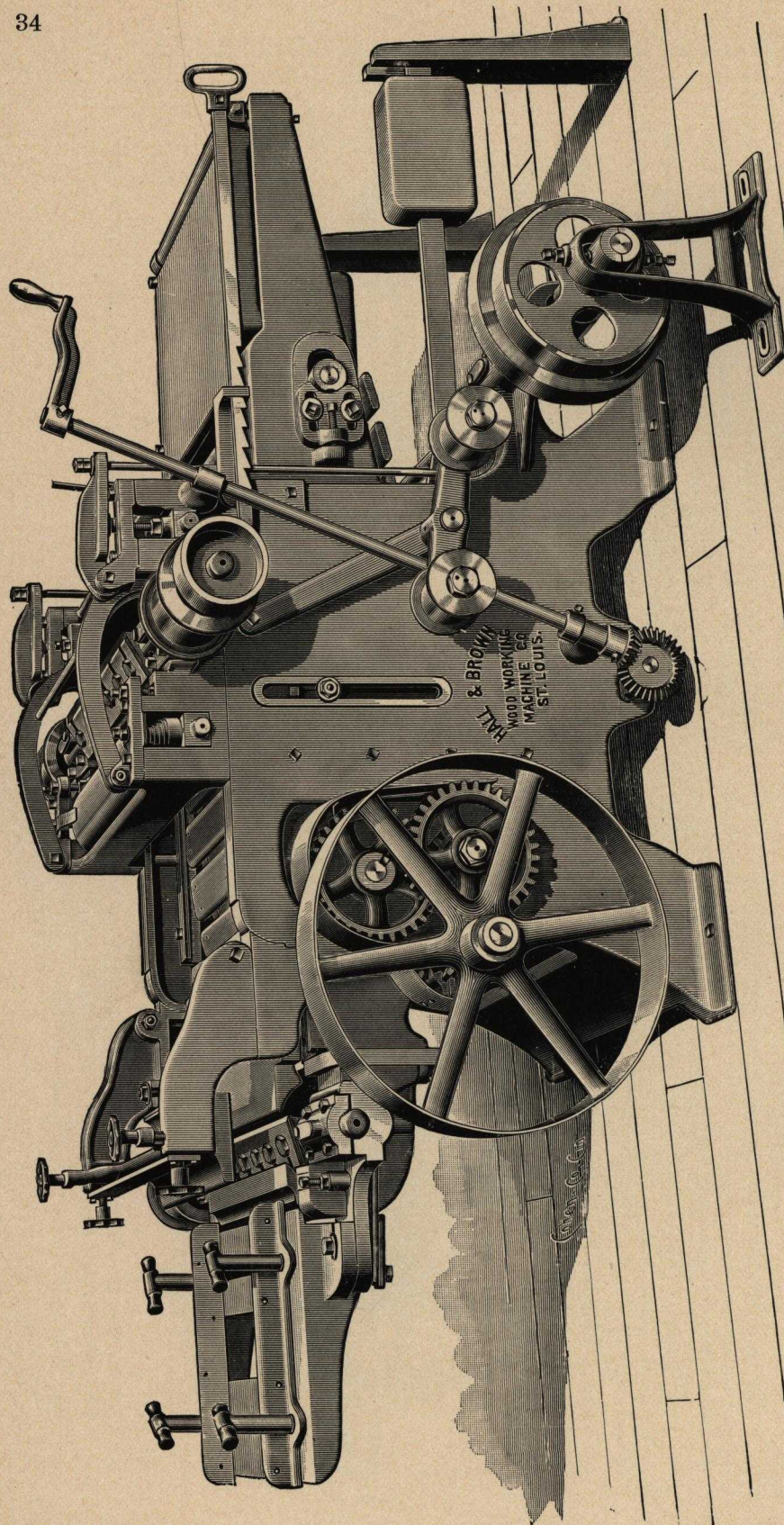
BELTS WHEN ORDERED.

Driving Belt 7½ or 8 inches wide, in length to suit from line shaft.

Two Top Cylinder Belts 5 inches wide, in lengths to suit from counter.

One Feed Belt 11 feet 2 inches long, 3½ inches wide.

One Feed Belt 8 feet long, 2 inches wide.



No. 2. 24-INCH ENDLESS BED DOUBLE SURFACER.

Weight, 4000 lbs.

No. 2. 24 Inch Endless Bed Double Surfacers.

Works 24 Inches Wide and 10 Inches Thick.

The Machine illustrated on the opposite page is intended for double surfacing all classes of lumber. It is heavy, substantial and well built, having a powerful and rapid feed, and is capable of doing a large amount of work, and is especially adapted to planing wet or icy lumber and embodies all the latest improvements.

The two cylinders are made of a solid forging, the head and shaft being in one piece; each head carries three knives. The top head is double belted, the bottom head being driven with one belt. The cylinder Journals are large size and run in long boxes lined with the best genuine metal.

Special attention has been given in the construction of the endless apron or slats and the Bed plates, over which the apron passes, which has heretofore, been the chief cause of complaint with this kind of a machine. The lags or slats are made heavy and ribbed in the center, having only two extreme end bearings, the Bed Plate over which slats pass being faced with steel which prevents wear. The carriers for the endless apron are large size, and the plain carrier roll flanged to prevent the aprons or slats crowding to the side of the Machine. The pressure rolls are large and fitted in adjustable boxes, the front roll being weighted, which is superior to springs to adapt itself to extreme variations in lumber. The back pressure roll is held by flat Steel Spiral Springs.

The top head is provided with two pressure bars, one on each side of the head, both easy of access and adjustable, which secures it against clipping the ends of the lumber. The receiving pressure bar or chip breaker is pivoted and can be swung clear of the head when it is desired to adjust or reset the knives.

A tightener is used for starting and stopping the feed, and the bed is raised or lowered by a hand wheel from the same side of the Machine; also, the Index for getting the desired thickness of the lumber to be dressed, thus avoiding the necessity of passing around the Machine to make the necessary adjustments. The bottom head is provided with a separate adjustment to regulate the cut. The hold-down or pressure bar over the under head can instantly be thrown back clear when it is desired to adjust or reset the knives.

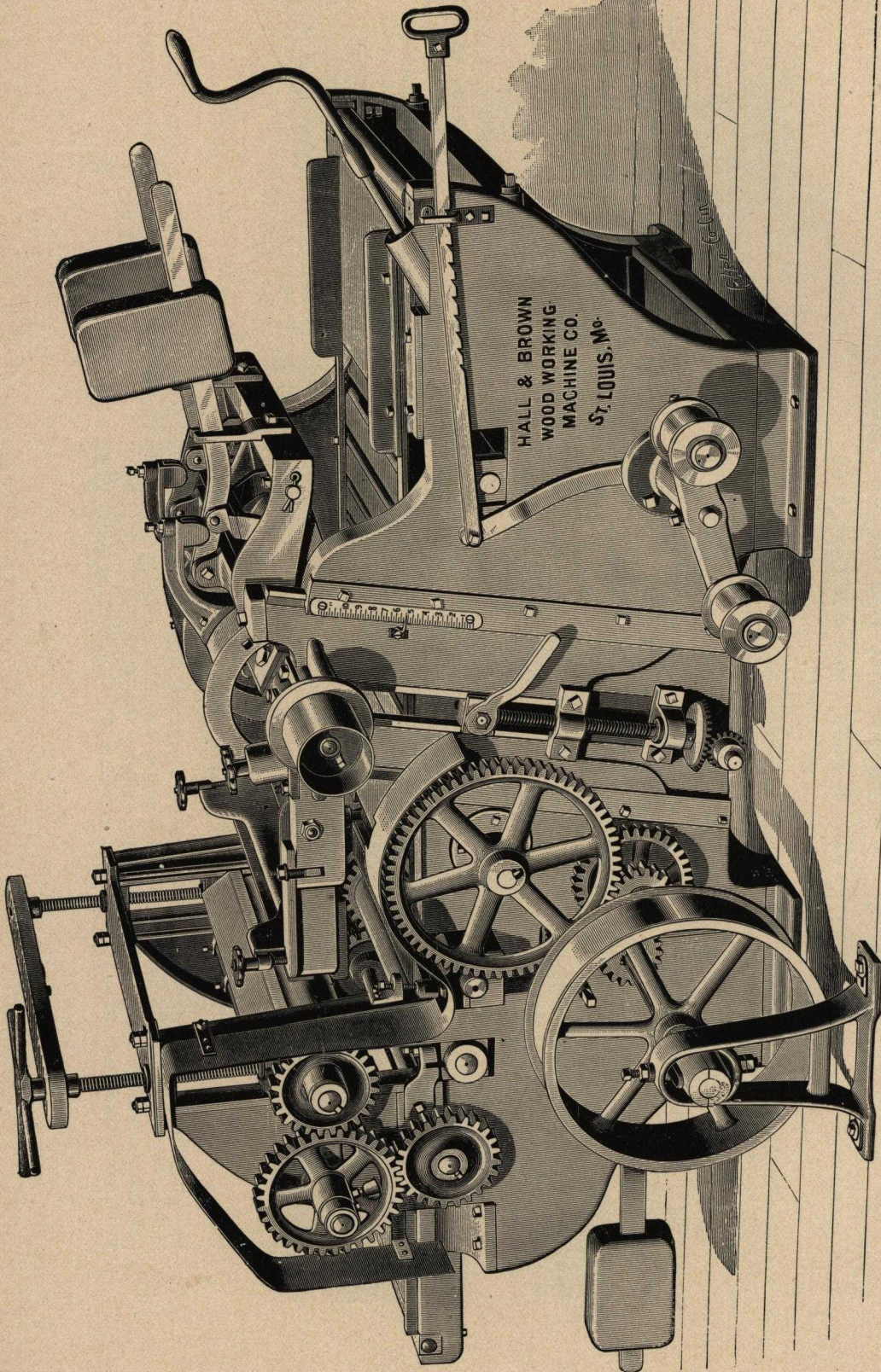
The Machine is built in the most thorough workmanlike manner; the bolts are all square heads, and the operator has free access to the bolt heads with suitable wrenches furnished for the purpose.

The tight and loose Pulleys are 12 inches in diameter, and 8½ inches face, and should make 900 revolutions per minute.

BELTS WHEN ORDERED.

By setting the counter shaft 8 feet from top cylinder floor line.
Driving Belt is 8 inches wide, in length to suit from line shaft.
One Bottom Cylinder Belt, 26 feet 2 inches long, 5½ inches wide.
Two Top Cylinder Belts, 20 feet 8 inches long, 5 inches wide.

One Feed Belt, 8 feet long, 2 inches wide.
One Feed Belt, 10 feet 3 inches long, 3 inches wide.



No. 3. 26 INCH ENDLESS BED DOUBLE SURFACER.
 Weight, 6860 Pounds.

No. 3. 26 inch Endless Bed Double Surfacers.

The Machine illustrated on the opposite page represents our new Endless Bed Double Surfacers, made to double surface 26 inches wide and 12 inches thick with sectional in-feeding pressure rolls and pressure bars, whereby two pieces of unevenly sawed lumber can be fed through the Machine at the same time.

The Machine is from an entirely new design and from a new set of patterns, having in view strength, convenience and durability.

It is provided with a strongly geared set of out-feeding rolls, whereby the lumber is carried entirely through the Machine past the under head.

The frame that supports the traveling bed is stationary, being firmly bolted to the sides with two wide ways or slide pieces for the traveling bed to pass over. The slats composing this traveling bed are made heavy and firmly locked together with steel rivets and driven by a heavy set of sprocket wheels.

The cylinder heads are made from a solid steel forging, shaft and head forged in one piece, and carry three knives each. The Cylinder Journals are large size and long, and run in boxes lined with the best quality of genuine babbitt metal.

The Top Cylinder is Double Belted, being driven by two 6 inch belts. The bottom head is belted upon one end and driven by one 6 inch belt.

The boxes for the top Cylinder Head Journals are cast to a heavy sliding piece right and left. These supports are planed up true, and the sides of the frame planed up to correspond which are then gibbed firmly to the frame; the top cylinder head is thereby raised and lowered to regulate the thickness to be planed, by the crank shown in cut, convenient for the operator.

The under Cutter head Journal boxes are cast connected together by a heavy casting; this casting is planed to fit a recess or pocket in the frame and has an independent adjustment by a crank to regulate a light or heavy cut.

The tight and loose Pulleys are 14 inches in diameter, and 8½ inch face and should make 900 revolutions per minute.

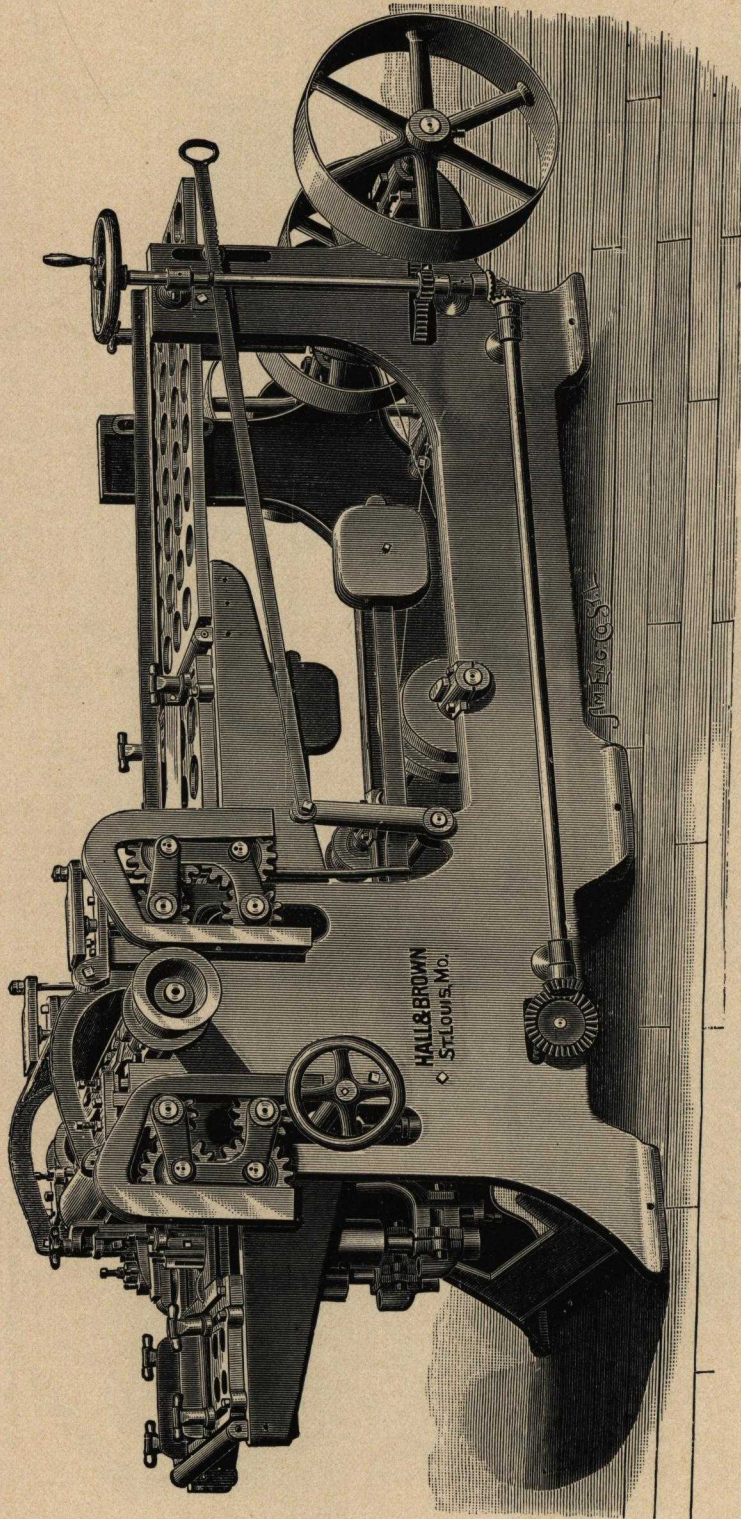
BELTS WHEN ORDERED.

When counter shaft is set 7 feet from the top Cutter Head, floor line measurement. One Feed Belt, 22 feet, 1 inch long, 4 inches wide.

Main Driving Belt 7½ or 8 inches wide, in length to suit from line shaft.

Two Top Cylinder Belts, 18 feet, 8 inches long, 5½ inches wide.

One Bottom Cylinder Belt, 21 feet, 11 inches long, 6 inches wide.



No. 1. 24 INCH SINGLE SURFACER AND MATCHER.

Weight 3670 Pounds.

No. 1. 24 Inch Single Surfacers and Matchers.

The opposite engraving represents our new improved Single Surfacers, Planers and Matchers, which embodies all the latest improvements, and its qualities of Strength, Resistance and Adjustability are visible in all its parts, and for price we are confident its superior is not to be found in the market.

The machine, as shown, will Single Surface 24 inches wide and 6 inches thick, and will Tongue and Groove 12 inches wide. We also make this machine as a double Surfacers and Matchers when required.

The Cylinder is of forged steel, shaft and all in one piece, and four sides with two sides slotted for working Drop Siding, Corrugated Ceiling, Moulded Casing, etc. It is double belted and has long bearings, lined with the best Babbitt metal, with suitable provision for lubricating.

The Side Heads are of Cast Steel, two sided, and run on Steel Spindles, which are Babbitted in yoke headstocks, and adjusted to different widths of stock by a hand wheel on the working side of the machine. By removing the heads and releasing two thumb-screws the Headstocks are swung below the bed when the machine is ready for Surfacing.

It is provided with two pressure bars, one each side of the Cylinder, both being easy of access and adjustable. The receiving pressure bar is pivoted and self-adjusting for different thicknesses of lumber.

The machine can be started up, or stopped and the table raised or lowered and the lumber gauged to a thickness without the operator leaving his position in feeding.

It has a powerful feed consisting of four 5-inch feed rolls all connected and driven.

The front roll is heavily weighted while the back one is held with flat steel coil springs, thus making a strong positive feed.

The machine is built in the most thorough workmanlike manner, the Cylinder bolts are all steel, and the machine screws all square heads and the operator has free access to all the screw heads, with suitable wrenches furnished for the purpose.

We furnish with each machine, one pair 24-inch straight knives, one set matcher cutters, each for flooring and ceiling, and one set beading cutters for ceiling and necessary wrenches for the machine.

Tight and loose Pulleys are 13 inches in diameter and 8 inch face, and should make 900 revolutions per minute.

BELTS WHEN ORDERED.

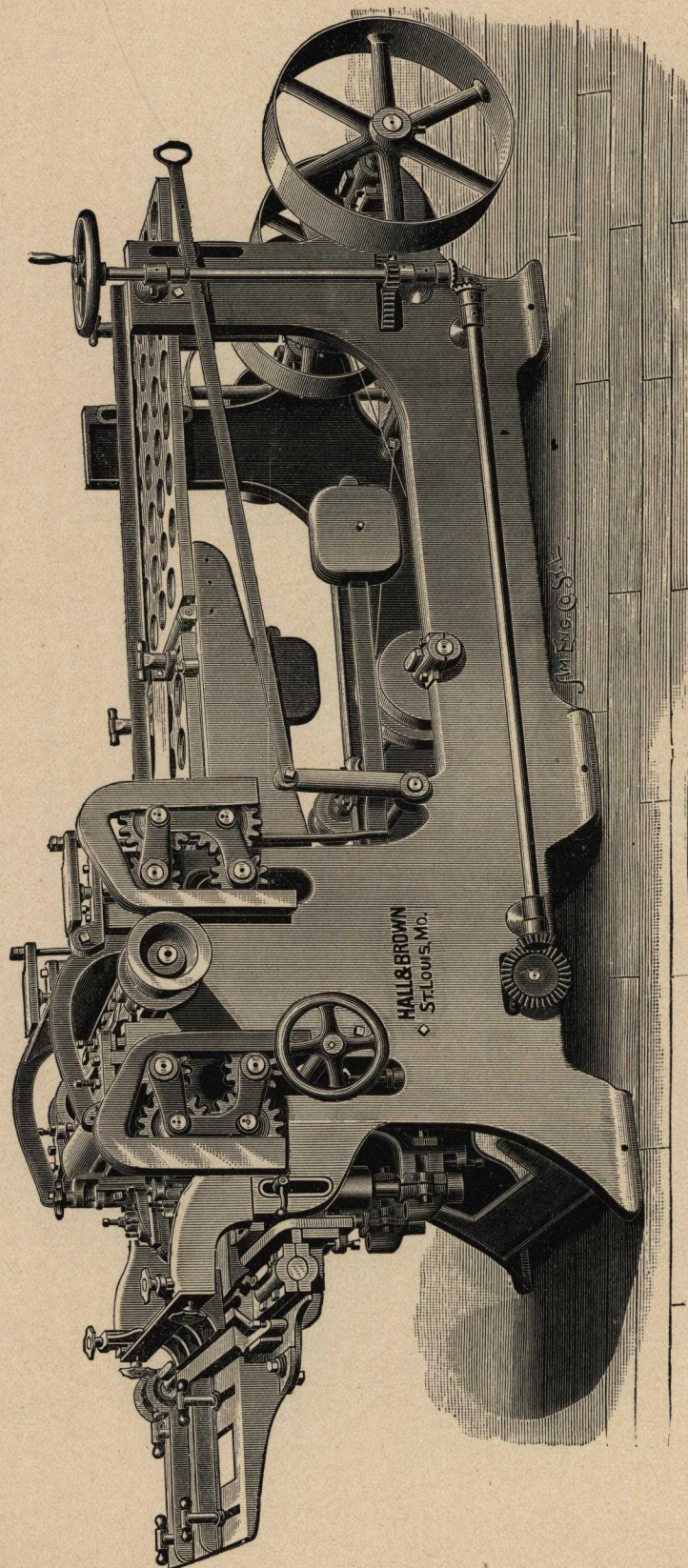
Driving Belt 7 inches wide, in length to suit from line shaft.

Two Top Cylinder Belts 16 feet 6 inches long, 5 inches wide.

Two Side Head Belts 17 feet 6 inches long, 3½ inches wide.

One Inside Feed Belt 10 feet 10 inches long, 2½ inches wide.

One Outside Feed Belt 10 feet 3 inches long, 4 inches wide.



No. 1. 24 INCH DOUBLE SURFACER AND MATCHER.

Weight, 4150 Pounds.

No. 1. 24 Inch Double Surfacer and Matcher.

The opposite engraving represents our new improved No. 1 Double Surfacer and Matcher, which embodies all the latest improvements, and its qualities of strength, resistance and adjustability are visible in all its parts, and for price we are confident its superior is not to be found in the market.

The machine, as illustrated, will double surface 24 inches wide and 6 inches thick, and will tongue and groove 12 inches wide.

The cylinders are of forged steel, shaft and all in one piece, and four sides with two sides slotted for working drop siding, corrugated ceiling, moulded casing, etc. It is double belted and has long bearings, lined with the best babbit metal, with suitable provision for lubricating.

The side heads are of cast steel, three sided, and run on steel spindles, which are babbitted in yoke head-stocks, and adjusted to different widths of stock by a hand wheel on the working side of the machine. By removing the heads and releasing two thumb-screws, the head stocks are swung below the bed, when the machine is ready for surfacing.

It is provided with two pressure bars, one each side of the cylinder, both being easy of access and adjustable. The receiving pressure bar is pivoted and self-adjusting for different thicknesses of lumber.

The machine can be started up, or stopped and the table raised, or lowered and the lumber gauged to a thickness without the operator leaving his position in feeding.

It has a powerful feed consisting of four 5-inch feed rolls, all connected and driven.

The front roll is heavily weighted while the back one is held with flat steel coil springs, thus making a strong positive feed.

The machine is built in the most thorough workmanlike manner, the cylinder bolts are all steel, and the machine screws are all square heads and the operator has free access to all the screw heads with suitable wrenches furnished for the purpose.

We furnish, with each machine, two pair 24-inch straight knives, one set of matcher cutters each, for flooring and ceiling, and one set beading cutters for ceiling, and necessary wrenches for the machine.

Tight and Loose Pulleys are 12 inches in diameter and 8 inch face, and should make 900 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt 7 inches wide, in length to suit from line shaft.

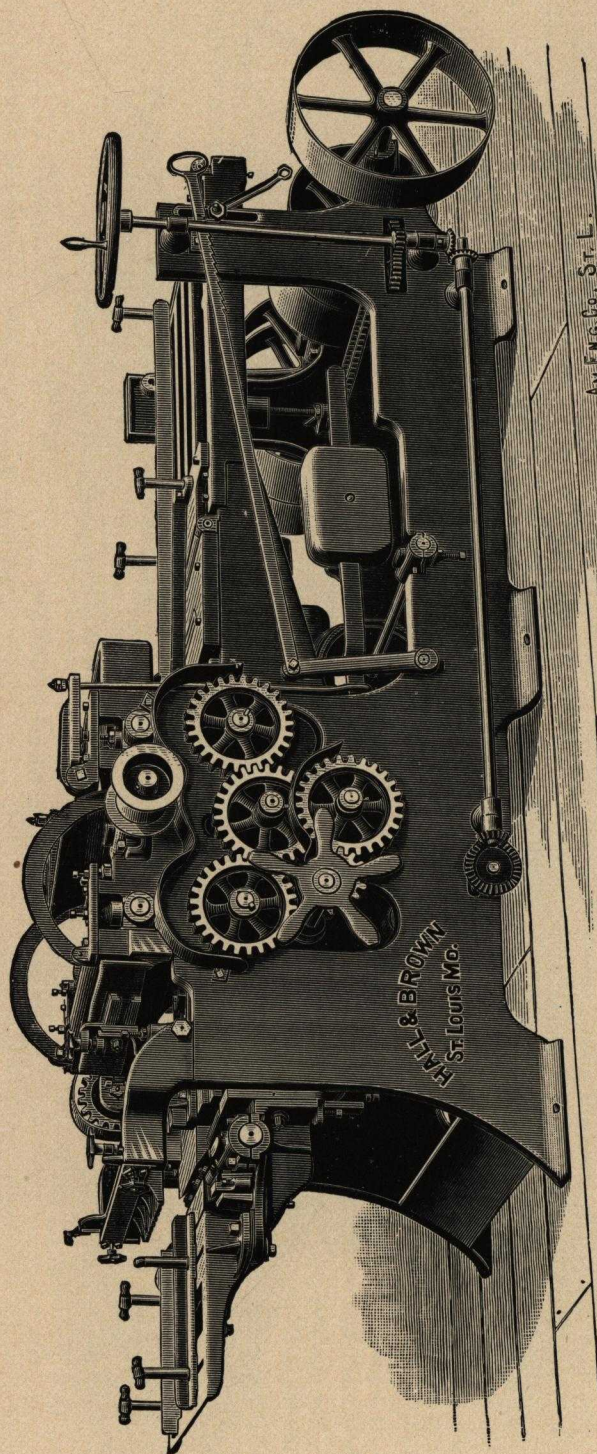
Two Top Cylinder Belts 16 feet 6 inches long, each 5 inches wide.

One Bottom Cylinder Belt 20 feet 5 inches long, 5 inches wide.

Two Side Head Belts 17 feet 6 inches long, each 3½ inches wide.

One Inside Feed Belt 10 feet 10 inches long, 2½ inches wide.

One Outside Feed Belt 10 feet 3 inches long, 4 inches wide.



No. 2. 14 INCH DOUBLE SURFACER AND MATCHER.

Weight, 14 Inch Double, 5000 Pounds.

No. 2. 14-Inch Double Surfacer and Matcher.

The opposite cut represents our 14-inch, 4-Roll Double Surfacer and Matcher.

The machine, as illustrated, will double surface, tongue and groove, or joint up to 14 inches wide and 6 inches thick.

All the latest improvements have been applied to this machine to reduce the time required in changing from surfacing to matching, or jointing.

The thickness of the lumber to be dressed can be regulated without stopping the machine, the Indicator for the thickness of the lumber to be dressed being placed in full view of the operator, and does not require him to leave his position in feeding to stop, or start the machine, or regulate the thickness of the lumber to be dressed.

The side spindles are sufficiently heavy to joint 6 inches.

Both top and bottom heads are forged steel, shaft and head in one piece, and has both 4-sides with 2-sides of each head slotted to accommodate moulding, beading or other cutters of irregular form, to be used at any position on the slotted sides of the heads.

The machine is provided with the most improved pressure bars and chip breaks; and facilities for quick and accurate adjustment have been carefully considered in its construction.

The counter-shaft is attached to the machine, and is thereby always in line and firm on the floor.

It has a powerful feed, consisting of four 6-inch rolls, all connected by heavy gearing and driving.

The machine is built in the most thorough, workmanlike manner; the cylinder bolts are steel, and cap screws are square heads, and the operator has free access to all the screw-heads, with suitable wrenches furnished for the purpose.

We furnish with each machine a pair of straight knives for each head; one set matcher cutters each for flooring and ceiling, and one set beading cutters for ceiling, and all necessary wrenches for the machine.

The tight and loose pulleys are 12 inches in diameter and 8 inches face, and should make 900 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 7½ inches wide, in length to suit from line shaft.

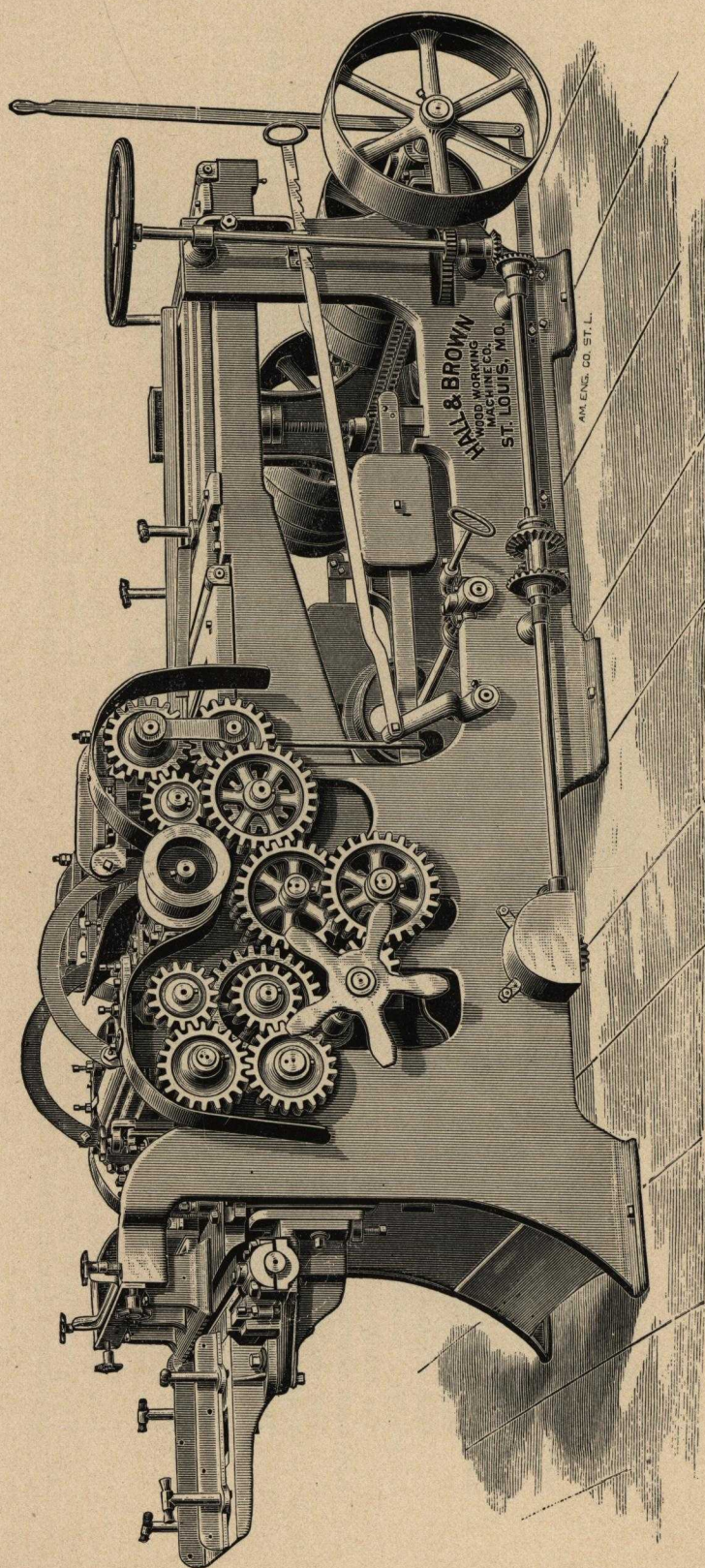
Two Top Cylinder Belts, 16 feet long each, 5 inches wide.

One Bottom Cylinder Belt, 21 feet long, 5 inches wide.

Two Side Head Belts, 17 feet 6 inches long each, 4 inches wide.

One Feed Belt, 10 feet 1 inch long, 4 inches wide.

One Feed Belt, 10 feet 6 inches long, 2½ inches wide.



No. 3. 26-INCH DOUBLE SURFACER AND MATCHER.

Weight, 5,500 lbs.

No. 3. 26 inch Double Surfacacer and Matcher.

The Machine herewith illustrated represents our 26-inch Four-Roll Planer and Matcher.

It will double surface 26 inches wide and from $\frac{1}{4}$ to 6 inches in thickness, and will tongue and groove 14 inches wide.

All the latest improvements have been applied to this Machine, to reduce the time required in changing from surfacing to matching or jointing.

If the Machine is required for surfacing only, the side spindles can be dropped below the bed, and for matching or jointing brought back in position for work.

We would call particular attention to the device for raising and lowering the bed.

The Rolls and Cylinder Heads are always in position, and to adjust for thickness of lumber to be dressed the bed must be raised or lowered.

When it is desired to adjust from 6 inches to $\frac{1}{4}$ inch, or any intermediate thickness, it can be done by power without stopping the Machine.

The thickness of the lumber to be dressed can also be regulated by the hand wheel shown in cut, if desired.

It is supplied with a powerful feed which consists of 4 6-inch rolls, all of which are driven by a heavy set of gearing at each end of the rolls.

The Cylinder Heads are made from a Solid Steel Forging, the head and shaft forged in one piece.

The heads are slotted on four sides and fitted with steel bolts and nuts.

The Cylinder Shafts are large size, running in long boxes which are lined with the best genuine Babbitt Metal.

The Top Cylinder Head is belted at both ends, the Bottom Cylinder Head is driven with one belt.

The Machine is provided with the most approved Pressure Bars and Chip Breakers, and the facilities for quick and accurate adjustment have been carefully considered in its construction.

We furnish with each Machine one pair of 26-inch and one pair 12-inch knives for each top and bottom head.

One set each, Solid Milled Bits for flooring and ceiling for the side heads and one set of Beading Bits for beaded ceiling, and all the necessary wrenches to fit the bolts and screws.

The Tight and Loose Pulleys are 12 inches in diameter and 8-inch face, and should make 800 or 850 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt $7\frac{1}{4}$ inches wide, in length to suit from line shaft.

Two Top Cylinder Belts, 16 feet long each, 5 inches wide.

One Bottom Cylinder Belt, 21 feet long 5 inches wide.

Two Side Head Belts, 17 ft. 6 inches long each, 4 inches wide.

One Feed Belt, 10 ft. 1 inch long, 4 inches wide.

One Feed Belt, 10 ft. 6 inches long, $2\frac{1}{4}$ inches wide.

No. 4. 24 inch Planer and Matcher.

The cut on opposite page fully illustrates our improved 24-inch 4 roll Stationary bed Planer and Matcher. The Machine is designed and constructed with a view to strength and convenience, and embodying all the latest improvements for a 4-roll Machine, suitable for a large range of work.

The Machine is made heavy in all its parts and will stand up to any kind of heavy or light work, such as oak, hickory, hard pine, &c., and is especially adapted to mills requiring a variety of work in both surfacing 24 inches wide and 6 inches thick, also for flooring, ceiling, drop siding, ship-lap, moulding, &c.

It is provided with a strong and powerful feed, the rolls being 8 inches in diameter and geared upon both ends by intermediate gears; these intermediate gears connecting the rolls being supported by shafts which are placed all the way across the Machine, thereby obtaining an equal strain upon each end of the rolls. Both front and back rolls are weighted thereby securing an even pressure the full width of the lumber.

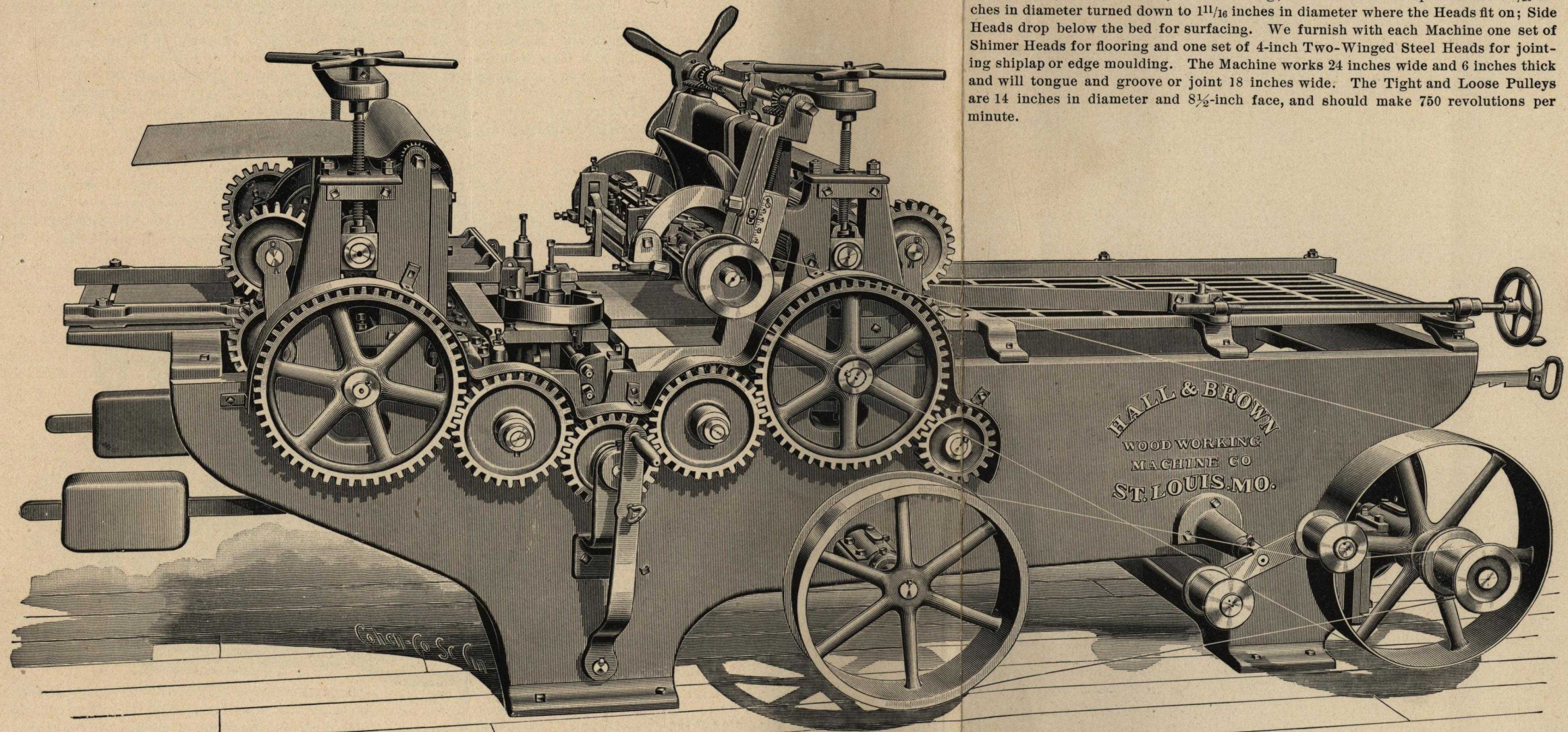
The top and bottom heads are slotted on four sides so that bits of various shapes or styles can be placed at any point on the heads, and the pressure bars can be adjusted to allow of projecting bits. The under cylinder head is placed in front of the two feeding out-rolls thereby carrying the lumber entirely through the Machine.

The side spindles are large size and run in long boxes babbitted with the best quality of genuine metal. The boxes in which the side spindles run are cast together with a heavy yoke casting and carefully fitted to the bed of the Machine, also at the bottom; both heads can be moved independently across the Machine thereby equalizing the wear on the bed. The side spindles can be instantly dropped below the bed without removing the heads when it is desired to surface 24 inches wide.

The chip-breaker and the hold-downs for the side heads have received careful attention; the breaker on the left or tongue side of the Machine swings clear of the head no matter how much the lumber varies in width. It is also clear of the matcher plate which prevents all liability of clogging with shavings or splinters being driven under to prevent its working free.

BELTS REQUIRED WHEN ORDERED.

- Driving Belt, 7½ inches wide, in length to suit from line shaft.
 2 Top Cylinder Belts, 16 feet 10 inches long, 5 inches wide.
 1 Under Cylinder Belt, 19 feet 9 inches long, 5½ inches wide.
 2 Side Head Belts, 17 feet 6 inches long, each 4 inches wide.
 1 Feed Belt, 13 feet 1 inch long, 4½ inches wide.
 Three changes of feed—50, 60 and 75 lineal feet per minute.



SPECIFICATIONS No. 4 FOUR-ROLL STATIONARY BED PLANER AND MATCHER.

Made to work 14 and 24 inches wide, and 6 inches thick, Single or Double.

Length of Frame, 10½ feet; Cylinder Heads of forged steel, Head and Shaft in one piece and slotted on all four sides; Feed Rolls, 8 inches in diameter; double-gear or geared on both ends of rolls; Cylinder Journals, 2 inches in diameter; Boxes for Cylinder Journals, 12 inches long; Steel Side Head Spindles are 1½ inches in diameter turned down to 1¼ inches in diameter where the Heads fit on; Side Heads drop below the bed for surfacing. We furnish with each Machine one set of Shimer Heads for flooring and one set of 4-inch Two-Winged Steel Heads for jointing shiplap or edge moulding. The Machine works 24 inches wide and 6 inches thick and will tongue and groove or joint 18 inches wide. The Tight and Loose Pulleys are 14 inches in diameter and 8½-inch face, and should make 750 revolutions per minute.

No. 4 FOUR-ROLL STATIONARY BED PLANER AND MATCHER.

Made to work 14 and 24 inches wide and 6 inches thick, Single or Double.

Weight, 24-inch Single, 7,600 lbs.

Weight, 24-inch Double, 7,900 lbs.

Weight, 14-inch Double, 7,000 lbs.

BELTS REQUIRED WHEN ORDERED.

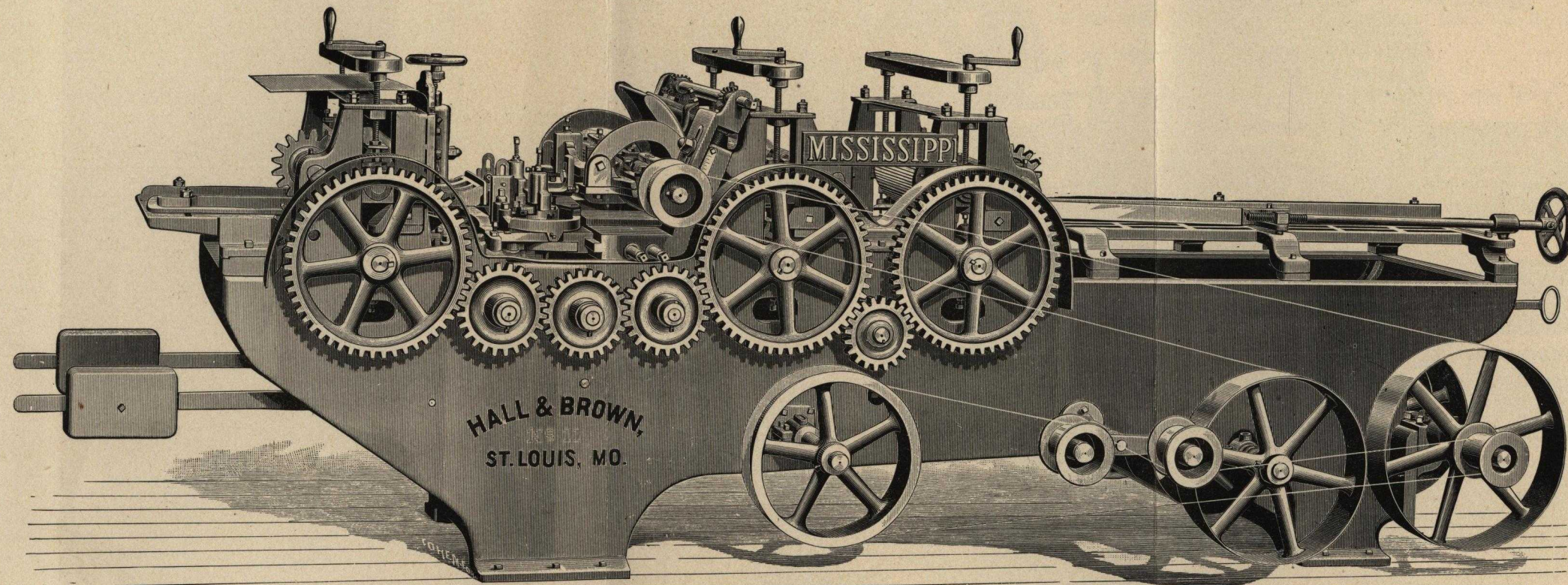
Driving Belt, 7 or 8 inches wide, in length to suit from line shaft.
 2 Top Cylinder Belts, 20 feet 8 inches long, each $4\frac{1}{2}$ inches wide.
 1 Bottom Cylinder Belt, 18 feet 4 inches long, 5 inches wide.
 2 Side Head Belts, 20 feet 9 inches long, each $3\frac{1}{2}$ inches wide.
 1 Feed Belt, 16 feet 3 inches long, 4 inches wide.

Three changes of feed—60, 75 and 90 lineal feet per minute.

SPECIFICATIONS FOR No. 1 MISSISSIPPI.

Made to work 7-9 and 14 inches wide and 3 inches thick, Single or Double.

Length of frame, 12 feet; Cylinder Heads of forged steel; Head and Shaft in one piece and slotted on all four sides; Feed Rolls, 7 inches in diameter; Cylinder Journals are $1\frac{13}{16}$ inches in diameter; Boxes for Cylinder Journals, 10 inches long; Steel Side Head Spindles, $1\frac{11}{16}$ inches in diameter, turned down to $\frac{17}{16}$ inches where the Heads fit on. We furnish with each Machine one set of Shimer Heads for flooring and one set of Two-Winged Steel Heads for edge moulding, shiplap or jointing. The Tight and Loose Pulleys are 12 inches in diameter and $8\frac{1}{2}$ -inch face, and should make 960 revolutions per minute.



No. 1 MISSISSIPPI.

Made to work 7-9 and 14 inches wide and 3 inches thick, Single or Double.

Weight of the 7-inch Double, 6,000 lbs.

Weight of the 9-inch Double, 6,600 lbs.

Weight of the 14-inch Double, 7,000 lbs.

No. 1. Mississippi Flooring Machine.

We invite the attention of all persons using Planing Mill Machinery, to our No. 1 Fast Feeding Flooring Machine, which has been recently designed by us with special reference to High Speed and Fast Powerful Feed. It has been constructed from an entire new set of patterns embodying many novel features, and every part proportioned with special reference to strength, convenience and durability.

The frame is heavy and substantial, with the counter shaft attached with an outside stand or support at the tight and loose pulley end of the shaft. The heads are supplied with steel bolts with case hardened nuts, the top cylinder is driven by two flange pulleys, the bottom cylinder has one, all receiving power from the same countershaft. The upper cylinder journal bearings are connected or cast together by a web extending across the machine, this frame is planed and dovetailed to the upright stands, which are also cast together with the bed plate which extends across the machine at the same time giving free access to the knives on the cylinder. The bed has a detachable plate for replaning or renewal when worn. The top cylinder and connected bearings are raised or lowered on the planed upright stands which are provided with a scale to indicate the thickness of the lumber to be planed.

The under cutter head journals are also cast together in a heavy frame and made to fit in a recess or pocket cast in the frame and can be adjusted up or down by screws arranged for the purpose; this frame carries or supports both pressure bars for the under head.

The front and back pressure bars for the top cylinder are self-acting and adjustable, the front or receiving pressure bar is attached to swinging arms which admits of its working close to and directly in front of the cylinder without any liability of contact with the cutters, both front and back pressure bars are adjustable up to or from the cutting cylinder for the purpose of admitting moulding, rustic, drop siding, or other cutters requiring larger circle.

The under head is also provided with pressure bars on each side which are also adjustable and easily removed for the purpose of sharpening or resetting the knives. The hold down bar or bed over the under cutter head has a vertical adjustment to suit different thicknesses of lumber and can be moved instantly out of the way across the machine by loosening one nut when access to the cutters is desired.

The side spindle frames or headstocks are each adjustable across the machine, by this means the friction of the lumber is distributed across the bed, and the wear can thus be equalized, and in case a heavier cut is desired on the right hand or groove side of the machine, the head can be moved up to the work instead of resetting the guide. The side spindles are large size and of the best quality of steel, running in long boxes lined with the best genuine babbitt metal, the bottom ends of the spindles run in a cup or recess cast on the headstock for the purpose of retaining the oil.

Our system of hold downs and chip breakers for the side heads are perfect and are all adjustable, the chip breaker on the left or tongue side of the machine swinging clear of the head, no matter how much the lumber to be dressed varies in width; it is also clear of the matcher plate, which prevents all liability of clogging with shavings or splinters driven under to prevent its working free.

It has powerful feed works consisting of six rolls 7 inches in diameter, two pair being placed in front of the upper cylinder, and one pair at the end of the machine beyond the under head, thereby carrying the lumber entirely through the machine, which greatly assists in keeping the board straight in passing the side heads and under cutters. All the rolls are heavily weighted and geared, the idle gears are mounted on shafts.

No. 2. Mississippi Flooring Machine.

We invite the attention of all persons using Planing Mill Machinery, to the Heavy Large Size Fast Feed Flooring Machine, which has been recently designed by us with special reference to High Speed and Fast Powerful Feed. It has been constructed from an entire new set of patterns embodying many novel features, and every part proportioned with special reference to strength, convenience and durability.

The frame is heavy and substantial, with the countershaft attached with an outside stand or support at the tight and loose pulley end of the shaft. The heads are supplied with steel bolts with case hardened nuts, the top cylinder is driven by two flange pulleys, the bottom cylinder has one, all receiving power from the same countershaft. The upper cylinder journal bearings are connected or cast together by a web extending across the machine, this frame is planed and dovetailed to the upright stands, which are also cast together with the bed plate which extends across the machine at the same time giving free access to the knives on the cylinder. The bed has a detachable plate for replaining or renewal when worn. The top cylinder and connected bearings are raised or lowered on the planed upright stands which is provided with a scale to indicate the thickness of the lumber to be planed.

The under cutter head journals are also cast together in a heavy frame and made to fit in a recess or pocket cast in the frame and can be adjusted up or down by screws arranged for the purpose, this frame carries or supports both pressure bars for the under head.

The front and back pressure bars for the top cylinder are self-acting and adjustable, the front or receiving pressure bar is attached to swinging arms which admits of its working close to and directly in front of the cylinder without any liability of contact with the cutters, both front and back pressure bars are adjustable up to or from the cutting cylinder for the purpose of admitting moulding, rustic, drop siding, or other cutters requiring larger circle.

The under head is also provided with pressure bars on each side which are also adjustable and easily removed for the purpose of sharpening or resetting the knives. The hold down bar or bed over the under cutter head has a verticle adjustment to suit different thicknesses of lumber and can be moved instantly out of the way across the machine by loosening one nut when access to the cutters is desired.

The side spindle frames or headstocks are each adjustable across the machine, by this means the friction of the lumber is distributed across the bed, and the wear can thus be equalized, and in case a heavier cut is desired on the right hand or groove side of the machine, the head can be moved up to the work instead of resetting the guide. The side spindles are large size and of the best quality of steel, running in long boxes lined with the best genuine babbitt metal, the bottom ends of the spindles run in a cup or recess cast on the headstock for the purpose of retaining the oil.

Our system of hold downs and chip breakers for the side heads are perfect and are all adjustable, the chip breaker on the left or tongue side of the machine swinging clear of the head no matter how much the lumber to be dressed varies in width, it is also clear of the matcher plate, which prevents all liability of clogging with shavings or splinters driven under to prevent its working free.

It has powerful feed works consisting of six rolls 10 inches in diameter, two pair being placed in front of the upper cylinder, and one pair at the end of the machine beyond the under head, thereby carrying the lumber entirely through the machine, which greatly assists in keeping the board straight in passing the side heads and under cutters. All the rolls are heavily weighted and geared at both ends, the idle gears are mounted on shafts which are connected at both ends by expansion links, thereby equalizing the strain on both ends of the rolls while feeding, thus an equal pressure is obtained upon both edges of the board, causing it always to hug the guide and feed through straight.

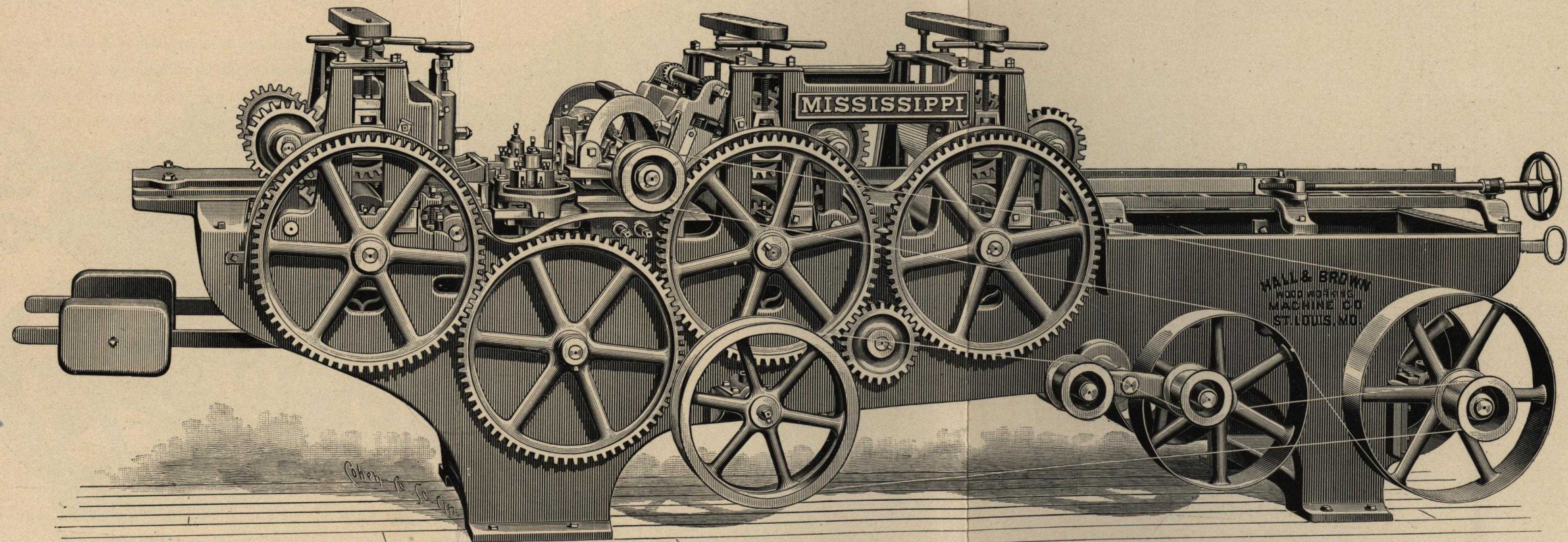
BELTS REQUIRED WHEN ORDERED.

Driving Belt, 7 or 8 inches wide, in length to suit from line shaft.
2 Top Cylinder Belts, 21 feet 5 inches long, each $5\frac{1}{2}$ inches wide.
1 Bottom Cylinder Belt, 19 feet long, $5\frac{1}{2}$ inches wide.
2 Side Head Belts, 21 feet 8 inches long, each 4 inches wide.
1 Feed Belt, 17 feet 7 inches long, $4\frac{1}{2}$ inches wide.
Three changes of feed—60, 75 and 90 lineal feet per minute.

SPECIFICATIONS FOR No. 2 MISSISSIPPI.

Made to work 7 and 14 inches wide and 4 inches thick, Single or Double.

Length of Frame, 13 feet 6 inches long; Cylinder Heads of forged steel; Head and Shaft in one piece and slotted on all four sides; Feed Rolls, 10 inches in diameter, double-gearred or geared upon both ends of Rolls; Cylinder Journals, 2 inches in diameter; Boxes for Top Cylinder 12 inches long; Boxes for Bottom Cylinder, 10 inches long; Steel Side Head Spindles, $1\frac{15}{16}$ inches in diameter, turned to $1\frac{11}{16}$ inches in diameter where the Heads fit on. We furnish one set of Shimer Heads for flooring and one set of Two-Winged Steel Heads for edge-moulding, shiplap or jointing. The Tight and Loose Pulleys are 14 inches in diameter and $8\frac{1}{2}$ -inch face, and should make 850 revolutions per minute.



No. 2 MISSISSIPPI.

Made to work 7 and 14 inches wide and 4 inches thick, Single or Double.

Weight, 7-inch Double, 7,400 lbs.

Weight, 14-inch Double, 8,500 lbs.

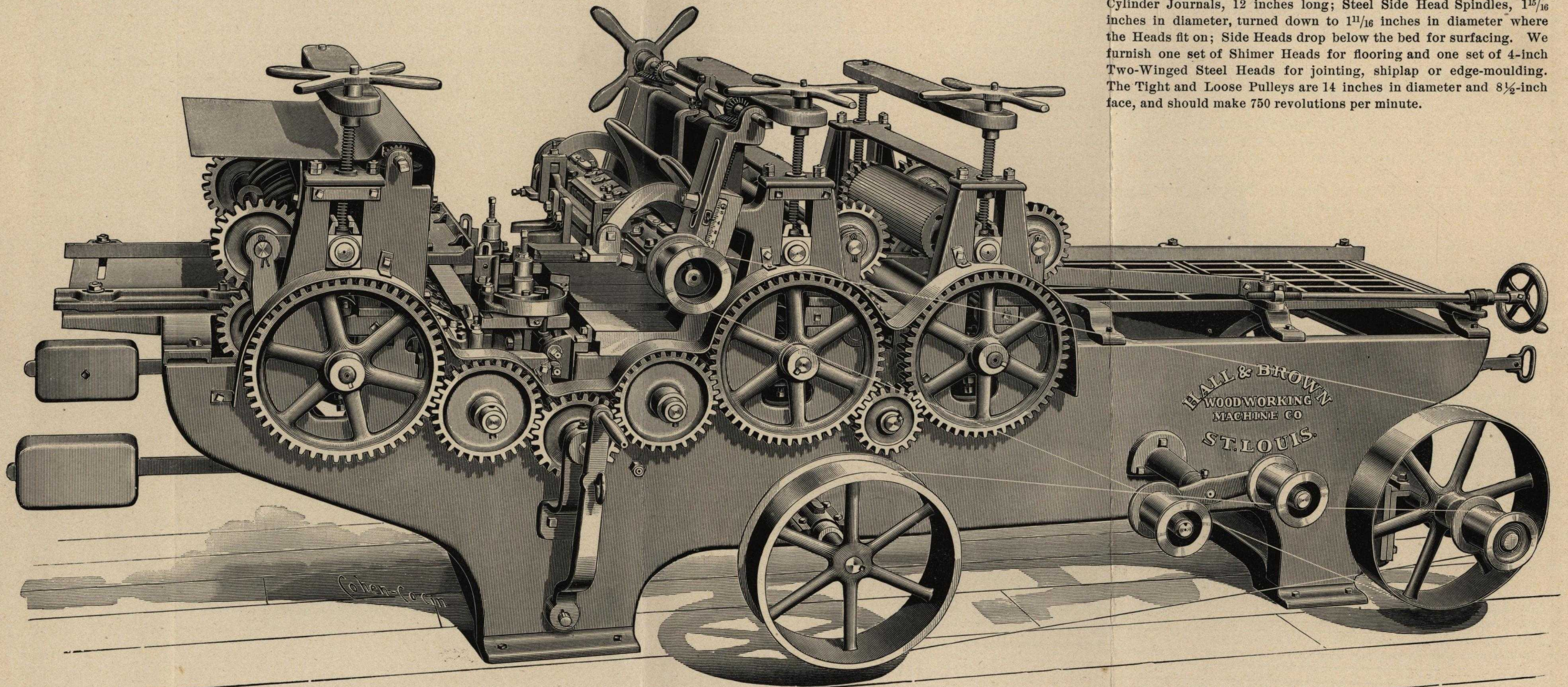
BELTS REQUIRED WHEN ORDERED.

Driving Belt, 7½ or 8 inches wide, in length to suit from line shaft.
 2 Top Cylinder Belts, 20 feet 1 inch long, each 5 inches wide.
 1 Under Cylinder Belt, 23 feet long, 5½ inches wide.
 2 Side Head Belts, 20 feet 9 inches long, each 4 inches wide.
 1 Feed Belt, 16 feet 4 inches long, 4½ inches wide.
 Three changes of feed—50, 60 and 75 lineal feet per minute.

SPECIFICATIONS No. 2½ MISSISSIPPI.

Made to work 14, 18, 20, 24 and 26 inches wide and 6 inches thick,
 Single or Double.

Length of frame, 12½ feet; Cylinder Heads of forged steel; Head and Shaft in one piece and slotted upon all four sides; Feed Rolls, 8 inches in diameter, double-gearred or geared upon both ends of the Rolls; Cylinder Journals, 1⅝ inches in diameter; Boxes for Cylinder Journals, 12 inches long; Steel Side Head Spindles, 1⅝ inches in diameter, turned down to 1⅞ inches in diameter where the Heads fit on; Side Heads drop below the bed for surfacing. We furnish one set of Shimer Heads for flooring and one set of 4-inch Two-Winged Steel Heads for jointing, shiplap or edge-moulding. The Tight and Loose Pulleys are 14 inches in diameter and 8½-inch face, and should make 750 revolutions per minute.



No. 2½ MISSISSIPPI.

Made to work 14, 18, 20, 24 and 26 inches wide and 6 inches thick, Single or Double.

Weight of the 24-inch Machine, Double, 9,150 lbs.

NO. 2 $\frac{1}{2}$. Mississippi Planer and Matcher.

The general design of the Machine is somewhat similar to our No. 1, 3 and 4 Mississippi, still there is quite a difference in the details of its construction. The Machine has been designed for general surfacing and matching and is especially adapted to mills requiring a large range of work, such as Railroad and Car Shops or Planing Mills requiring a good surfacer and matcher to stand up to both heavy and light work. We make this Machine to work 14-18-20 and 24 inches wide and 6 inches thick. The 24 inch Machine will tongue and groove or Joint up to 18 inches wide, The Side Spindles can be dropped below the bed without removing the heads when it is desired to surface the full width of the Machine.

It is provided with a powerful feed consisting of 6, 8 inch rolls strongly geared, one set of rolls being placed at the out-feeding end of the Machine beyond the under head thus carrying the lumber entirely through the Machine, which is important in keeping the material straight in passing the side heads under cutters. The feed rolls are geared upon both ends, the idle gears being mounted on shafts placed across the Machine which are connected at both ends of the rolls by expansion links, thereby equalizing the strain upon both ends of the rolls while feeding and taking the heavy cuts intended by this Machine, and an equal pressure is thereby obtained upon the surface of the lumber causing it always to hug the guide and feed through straight.

Pressure Bars and Chip Breakers for the top, bottom and side heads have received careful attention. Both front and back pressure bars for the Top Head are adjustable up to, or from the head so that long bits requiring a larger cutting circle can be used. The under Head is also provided with a pressure bar upon each side which are also adjustable and can easily be removed for the purpose of sharpening or re-setting the knives.

The chip-breakers for the side heads are all adjustable, the one on the left or tongue side swinging clear of the head regardless of the width of the lumber, or cut being taken, it also swings clear of the matcher plate to avoid clogging with shavings or splinters.

The Journal Boxes for both top and bottom cylinder heads are each cast connected together in heavy frames planed up true. The top Head being adjustable for the thickness to be planed, the bottom head being adjustable for the depth of cut.

The Headstocks supporting the side spindles are each separately adjusted all the way across the bed of the Machine also enabling the operator to adjust the right hand head for a light or heavy cut, without resetting the guide.

The tight and loose Pulleys are 14 inches in diameter and 8 $\frac{1}{2}$ inches wide and should make 750 revolutions per minute.

No. 3. Mississippi Planer and Matcher.

The Machine illustrated on the opposite page represents our No. 3 Mississippi, especially designed for heavy dimension lumber, ship-lap or flooring and is made to work Single or Double, 14, 18, 20, 24 and 26 inches wide and 6 inches thick, and to tongue and groove 14, 18, 20 and 22 inches wide.

It will be noticed that the design is somewhat similar to our No. 1 Mississippi, still it is built from an entire different set of patterns and made proportionately heavy in all its parts.

It is provided with a powerful feed consisting of 6 10-inch rolls strongly geared, one set of rolls being placed at the out-feeding end of the Machine beyond the under head thus carrying the lumber entirely through the Machine, which is important in keeping the material straight in passing the side heads and under cutters. The feed rolls are geared upon both ends in the same manner as upon our No. 2 Mississippi, the idle gears being mounted on shafts placed across the Machine which are connected at both ends of the rolls by expansion links thereby equalizing the strain upon both ends of the rolls while feeding and taking the heavy cuts intended by this Machine, and an equal pressure is thereby obtained upon the surface of the lumber causing it always to hug the guide and feed through straight.

Pressure Bars and Chip Breakers for the top, bottom and side Heads have received careful attention. Both front and back Pressure Bars for the Top Head are adjustable up to, or from the Head, so that long bits requiring a larger cutting circle can be used. The under head is also provided with a Pressure Bar upon each side which are also adjustable and can easily be removed for the purpose of sharpening or resetting the knives.

The Chip-Breakers for the Side Heads are also adjustable, the one on the left or tongue side swinging clear of the Head regardless of the width of the lumber, or cut being taken, it also swings clear of the Matcher Plate to avoid clogging with shavings or splinters.

The Journal Boxes for both top and bottom Cylinder Heads are each cast connected together in heavy frames planed up true. The top Head being adjustable for the thickness to be planed, the bottom Head being adjustable for the depth of cut.

The Side Spindles are large size and the headstocks supporting same are each separately adjusted all the way across the bed of the Machine also enabling the operator to adjust the right hand Head for a light or heavy cut, without resetting the guide.

The Tight and Loose Pulleys on the 24 and 26 inch Machines are 14 inches in diameter and 10½ inch face and should make 800 revolutions per minute.

Tight and Loose Pulleys for the 14, 18 and 20 inch Machines are 14 inches in diameter and 8½ inch face, and should make 800 revolutions per minute.

BELTS REQUIRED WHEN ORDERED.

For 24 and 26-inch Machines.

Driving Belt, 10 inches wide, in length to suit from line shaft.
 2 Top Cylinder Belts, 21 feet 6 inches long, each 6 inches wide.
 1 Under Cylinder Belt, 19 feet 2 inches long, 6½ inches wide.
 2 Side Head Belts, 21 feet 7 inches long, each 4½ inches wide.
 1 Feed Belt, 17 feet 3 inches long, 4½ inches wide.
 Three changes of feed—46, 58 and 70 lineal feet per minute.

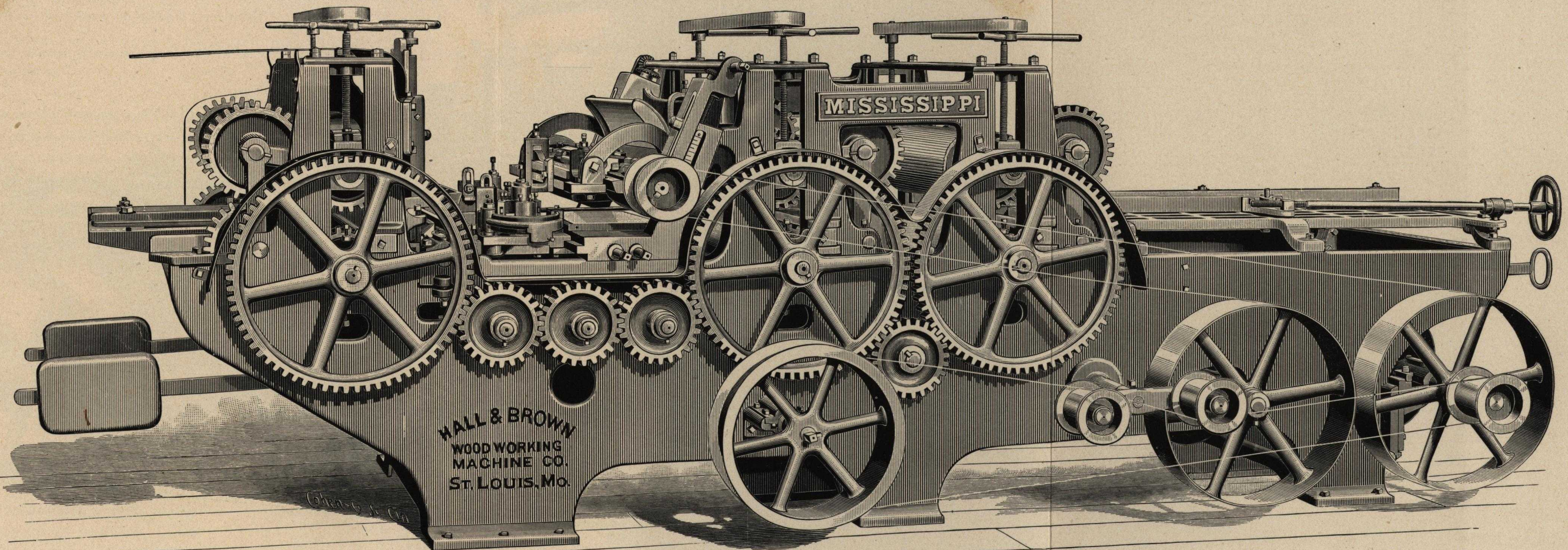
For 14, 18 and 20-inch Machines.

Driving Belt, 8 inches wide, in length to suit from line shaft.
 2 Top Cylinder Belts, 21 feet 7 inches long, each 5½ inches wide.
 1 Bottom Cylinder Belt, 19 feet 8 inches long, 6 inches wide.
 2 Side Head Belts, 22 feet long, each 4½ inches wide.
 1 Feed Belt, 17 feet 3 inches long, 4½ inches wide.
 Three changes of feed—46, 58 and 70 lineal feet per minute.

SPECIFICATIONS FOR No. 3 MISSISSIPPI.

Made to work 14, 18, 20, 24 and 26 inches wide and 6 inches thick, Single or Double.

Length of Frame, 14 feet; Cylinder Heads of forged steel; Head and Shaft in one piece and slotted on all four sides; Feed Rolls, 10 inches in diameter, double-gearred or geared upon both ends of Rolls; Cylinder Journals for 24 and 26-inch Machines, 2⅝ inches in diameter, on 14 and 18-inch Machines, 2¼ inches in diameter; Cylinder Journals on all sizes of No. 3, 12 inches long; Steel Side Head Spindles are 1⅝ inches in diameter turned down to 1⅞ inches in diameter where the Heads fit on. We furnish one set of Shimer Heads for shiplap or flooring, one set of Two-Winged Steel Heads for edge-moulding, shiplap or jointing, and one set of Three-Side, 6-inch Jointing Heads. The Tight and Loose Pulleys on the 24 and 26-inch Machine are 14 inches in diameter and 10½-inch face, and should make 800 revolutions per minute. Tight and Loose Pulleys for the 14, 18 and 20-inch Machines are 14 inches in diameter and 8½-inch face, and should make 800 revolutions per minute.



No. 3 MISSISSIPPI.

Made to work 14, 18, 20, 24 and 26 inches wide and 6 inches thick, Single or Double.

Weight of 14-inch Double, 9,300 lbs.

Weight of 18-inch Double, 9,650 lbs.

Weight of 20-inch Double, 9,870 lbs.

Weight of 24-inch Double, 10,290 lbs.

Weight of 26-inch Double, 10,600.

BELTS REQUIRED WHEN ORDERED.

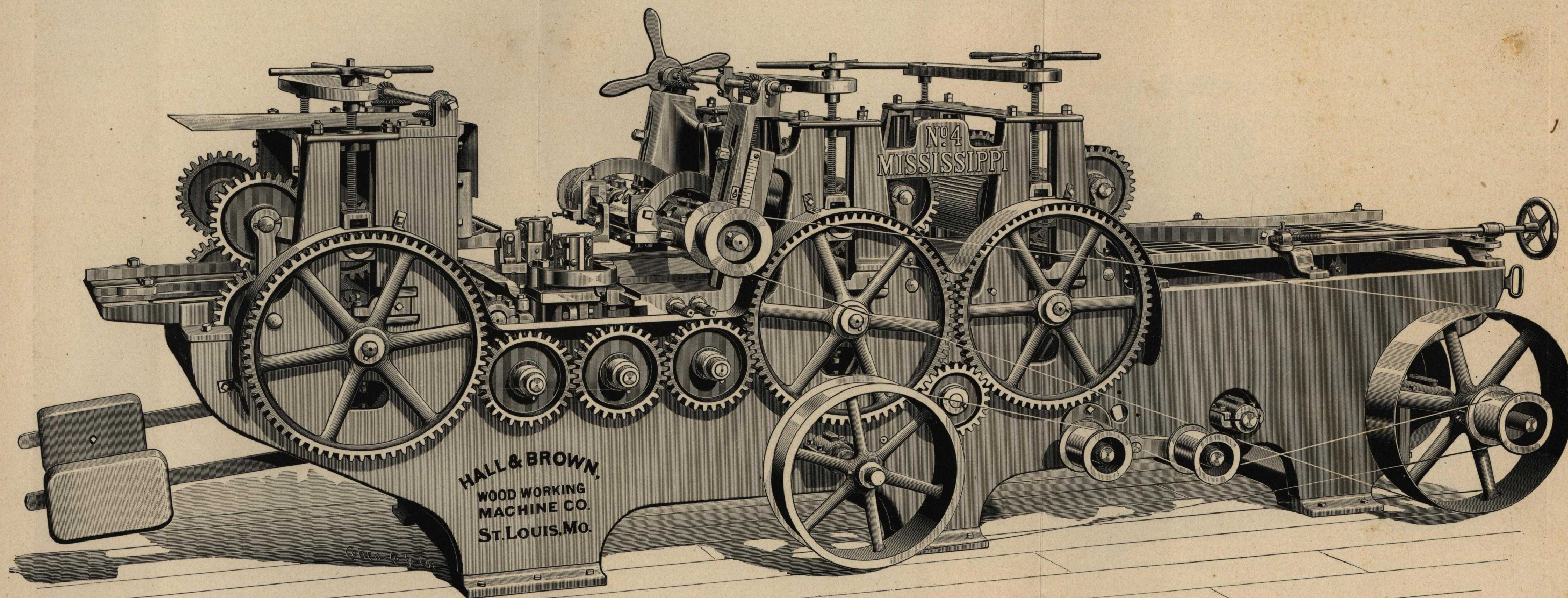
Driving Belt, 10 inches wide, in length to suit from line shaft.
2 Top Cylinder Belts, 21 feet 6 inches long, each 6 inches wide.
1 Bottom Cylinder Belt, 19 feet 2 inches long, 6½ inches wide.
2 Side Head Belts, 21 feet 7 inches long, each 5 inches wide.
1 Feed Belt, 17 feet 3 inches long, 5 inches wide.

Three changes of feed—46, 58 and 70 lineal feet per minute.

SPECIFICATIONS FOR No. 4 MISSISSIPPI.

Made to work 26 inches wide and 8 inches thick, Single or Double.

Length of Frame, 14 feet 6 inches; Cylinder Heads of forged steel; Head and Shaft in one piece and slotted on all four sides; Feed Rolls, 10 inches in diameter, double-gearred or geared upon both ends of Rolls; Cylinder Journals are 2⅝ inches in diameter; Boxes for Cylinder Journals, 12 inches long; Steel Side Head Spindles, 1⅝ inches in diameter, turned down to 1¼ inches in diameter where the Heads fit on. We furnish one set of Shimer Heads for either shiplap or flooring, one set of Two-Winged Steel Heads for edge-moulding, shiplap or jointing and one set of 8-inch Jointing Heads. Tight and Loose Pulleys are 14 inches in diameter and 10½-inch face, and should make 800 revolutions per minute.



No. 4 MISSISSIPPI.

Made to work 26 inches wide and 8 inches thick, Single or Double.

Weight of the 26-inch Double, 11,000 lbs.

No. 4. Mississippi Planer and Matcher.

The cut on the opposite page is a larger and more powerful Machine than our No. 3 illustrated and described on the two preceding pages. Its general design and construction is the same except in the increased size and weight, also width and thickness it works.

The frame of this Machine is 14 feet 6 inches long and made heavy throughout to withstand the continued hard work for which it is intended.

It is made to work Single or Double, 26 inches wide and 8 inches thick, and to tongue and groove 22 inches wide.

The feed is very powerful and consists of 6-10 inch Double geared rolls, two pairs of in-feeding and one pair of out-feeding, the last pair of rolls feeding the lumber entirely through the Machine past the side Heads and under cutters. These rolls are all driven by a powerful set of gears designed and proportioned for hard work. All of our feed roll shafts are large size, of steel and pass entirely through the rolls.

The Cylinder Heads are made from a solid steel forging, head and shaft forged in one piece and slotted on all four sides. They have large Journals and long bearings. The Top Head being driven by two 6 inch belts, the bottom Head being driven by one or two belts, as ordered.

The upper and under cutter head bearings are each cast connected together by a heavy frame. The upper cutter head frame being planed up true and recessed and mounted on upright stands, which are cast solid to the bed plate, which are also planed up true and recessed to fit, thereby always retained in line or level with the bed plate when being adjusted for the different thicknesses of lumber to be dressed. The receiving Pressure Bars for the Top Head are adjustable to or from the Head, and will always swing clear of the knives.

The under cylinder head frame upon which the Cylinder Journals are cast are planed up true and made to fit a recess or pocket on each side of the Machine and is provided with a vertical adjustment to suit the cut desired.

The spindles for the Side Heads are large size with wide Journals. The Frames which carry the side Spindles are heavy with the Journal Box cast on and carefully fitted to the supports, top and bottom; both are independently adjusted across the bed of the Machine so that the wear of the bed can be equally distributed.

Tight and Loose Pulleys are 14 inches in diameter and $10\frac{1}{2}$ inches face, and should make 800 revolutions per minute.

No. 9. Hoo-Hoo Dimension Planer and Matcher.

This is our largest and heaviest six-roll Planing and Matching Machine, weighing nearly seven tons and somewhat different in design and construction from either of our Mississippi Planers. It will Double or Single Surface 30 inches wide and 8 inches thick, and will tongue and groove, work ship-lap or size up to 27 inches wide.

It is provided with sectional in-feeding rolls and chip breakers, whereby two pieces of lumber of different thicknesses can be fed through the Machine at the same time. It is also provided with a center guide whereby two pieces of lumber 12 inches wide and 8 inches thick or less can be worked on three sides at the same time.

The Frame is 15 feet in length and the Machine and all its parts are made proportionately heavy throughout to withstand the severe strain it must be subject to, to accomplish the work for which it was intended.

It is provided with a strong and powerful feed works, consisting of three sets of 10 inch rolls geared upon both ends, which in turn are driven by a heavy set gearing. The idle or intermediate gears working on shafts passing across the Machine. One set of these rolls being placed at the outfeeding end of the Machine, thus carrying the lumber entirely through past the side heads and under cutters.

The two cylinder heads with the Journals are made of solid forged steel and slotted upon all four sides. The upper Cylinder is driven by two 6 inch belts, the bottom Cylinder with one or two as ordered, both Cylinders receiving power from the same counter shaft. The Journal Bearings for both Cylinders are cast upon heavy frames; the frame carrying the upper Cylinder is planed to fit correspondingly planed up stands, these being cast solid to the bed plate. The frame carrying the upper cylinder is thereby adjustable by a crank to regulate the thickness of the lumber to be worked. The frame carrying the under head is also planed up and is adjustable for the desired depth of cut.

The two frames carrying the side Spindles are planed up carefully to fit both top and bottom and each are adjusted separately across the bed of the Machine, thereby equalizing the wear upon the bed. On all of our six roll Machines we use a false or interchangeable bed plate which can be taken off and planed over, or replaced, to save taking the Machine apart when worn.

The Tight or Driving Pulley is 16 inches in diameter and 12 inches face and should make 760 revolutions per minute.

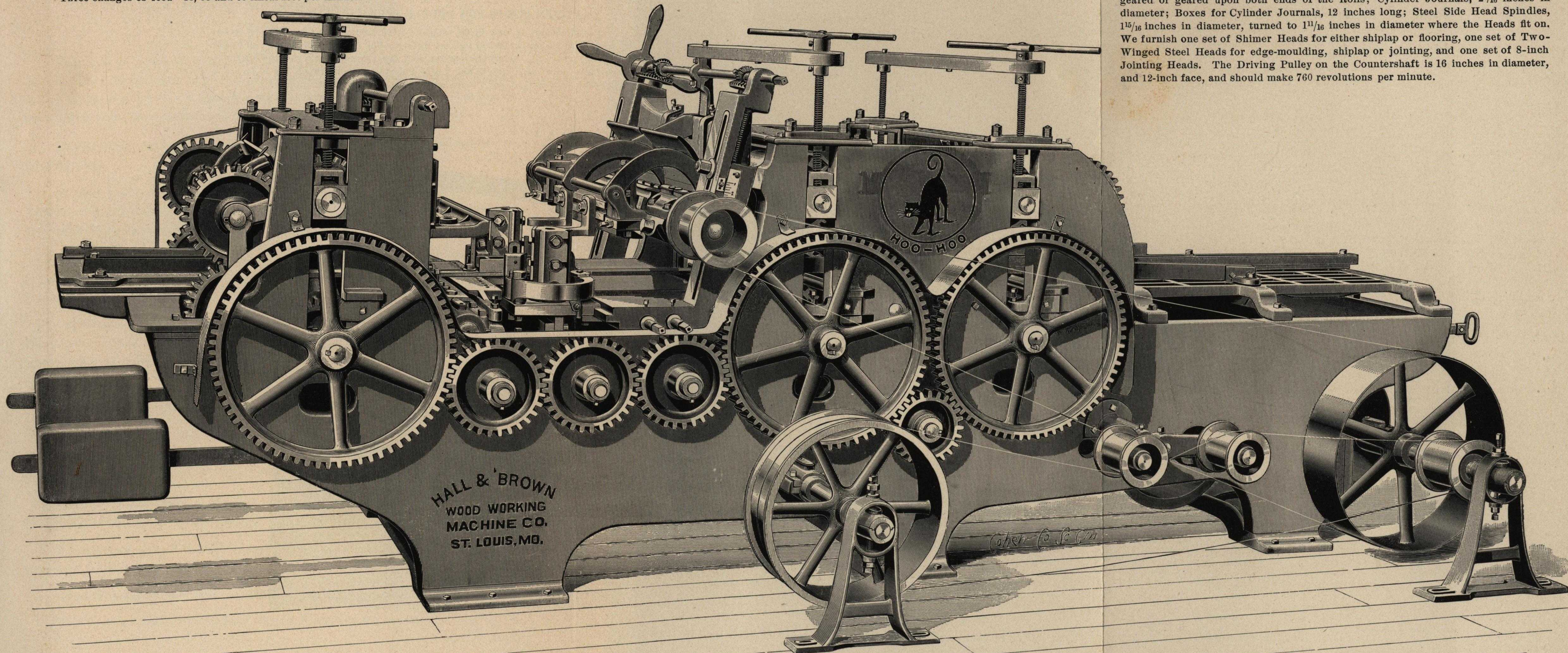
BELTS REQUIRED WHEN ORDERED.

Driving Belt, 12 inches wide, in length to suit from line shaft.
 2 Top Cylinder Belts, 21 feet 6 inches long, each 6½ inches wide.
 1 Under Cylinder Belt, 19 feet 10 inches long, 7 inches wide.
 2 Side Head Belts, 22 feet long, 5 inches wide.
 1 Feed Belt, 17 feet 7 inches long, 5 inches wide.
 Three changes of feed—44, 55 and 68 lineal feet per minute.

SPECIFICATIONS FOR No. 9 HOO-HOO DIMENSION PLANER AND MATCHER, WITH SECTIONAL IN-FEEDING ROLLS AND CENTER GUIDE.

Made to work 30 inches wide, 8 inches thick.

Length of Frame, 15 feet; Cylinder Heads of forged steel; Head and Shaft in one piece and slotted on all four sides; Feed Rolls 10 inches in diameter, double-gear or geared upon both ends of the Rolls; Cylinder Journals, 2⅝ inches in diameter; Boxes for Cylinder Journals, 12 inches long; Steel Side Head Spindles, 1⅝ inches in diameter, turned to 1⅞ inches in diameter where the Heads fit on. We furnish one set of Shiner Heads for either shiplap or flooring, one set of Two-Winged Steel Heads for edge-moulding, shiplap or jointing, and one set of 8-inch Jointing Heads. The Driving Pulley on the Countershaft is 16 inches in diameter, and 12-inch face, and should make 760 revolutions per minute.



No. 9 HOO-HOO DIMENSION PLANER AND MATCHER, WITH SECTIONAL IN-FEEDING ROLLS AND CENTER GUIDE.

Made to work 30 inches wide, 8 inches thick.

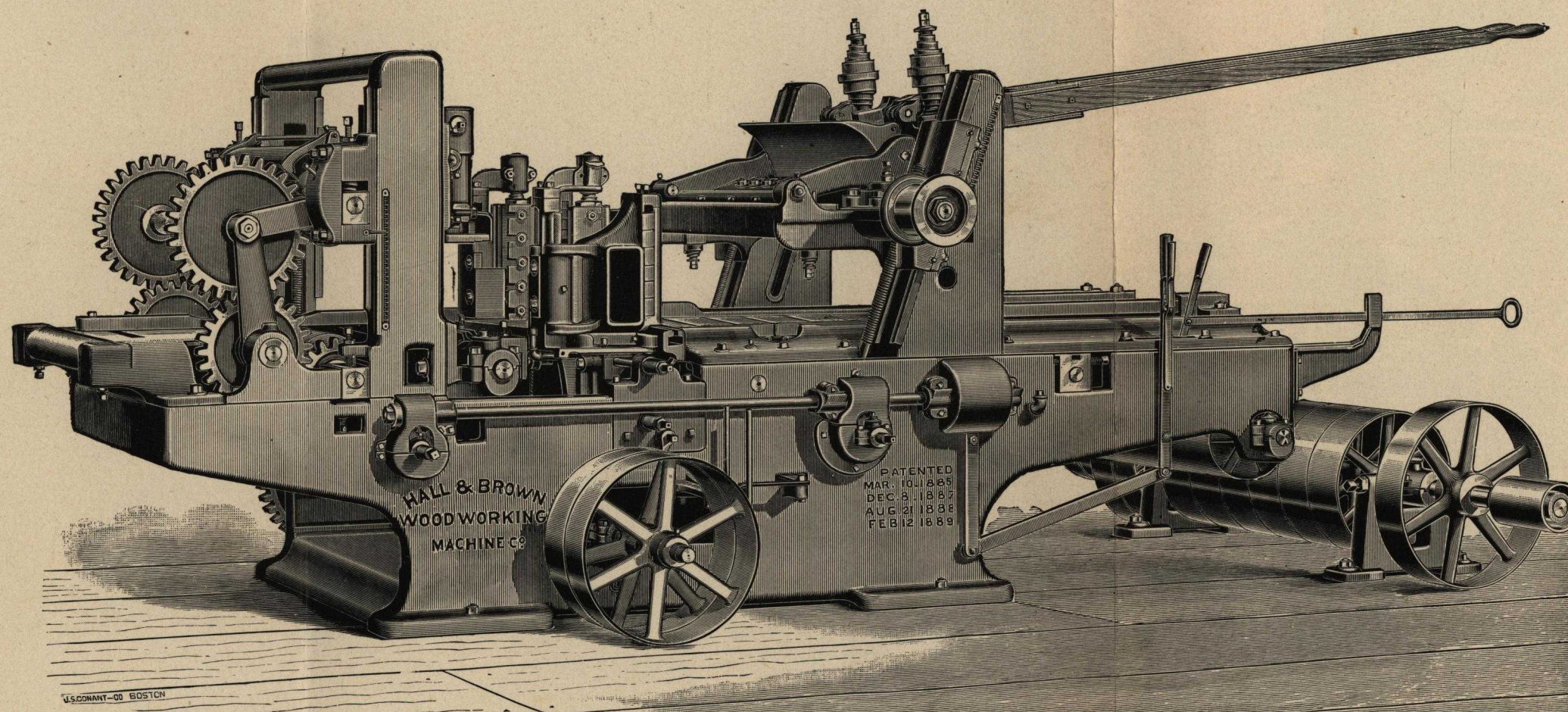
Weight, 13,600 pounds.

BELTS REQUIRED WHEN ORDERED.

Driving Belt, 10 inches wide, in length to suit from line shaft.
2 Top Cylinder Belts, 18 feet 5 inches long, each 6 inches wide.
1 Bottom Cylinder Belt, 25 feet 8 inches long, 6 inches wide.
2 Side Head Belts, 22 feet 2 inches long, each 5 inches wide.
1 Feed Belt, 20 feet 8 inches long, 5 inches wide.

SPECIFICATIONS FOR DOUBLE SURFACER AND SIZER.

Length of Frame, 13 feet long; weight, 14,000 lbs; works four sides 30 inches wide and 14 inches thick; Carrying-Out Rolls are $9\frac{1}{2}$ inches in diameter; all Cutter Head Spindles are $2\frac{1}{4}$ inches in diameter, and the Cylinder Pulleys are 6 inches in diameter for 6-inch belts. Tight and Loose Pulleys on Countershaft are 16 inches in diameter and 10-inch face, and should make 1,000 revolutions per minute.



NEW DOUBLE SURFACER AND SIZER.

Made to work 30 inches wide, 14 inches thick.

Weight, 14,000 Pounds.

New Double Surfacers and Sizer.

This Machine is adapted and designed for planing all kinds of Bill Timber perfectly square. Heavy Girder Beams may be chamfered or beaded, and the machine is well suited for doing a variety of mill work. It is provided with Carrying-out Rolls, Weighted and Expansion Side Chip Breakers, Sectional Rolls and Bars, Cutter Head Boxes yoked together, etc.

A Centre Guide can be applied which enables two pieces to be dressed simultaneously on three sides each.

The feed consists of an endless or lag bed, with a pair of carrying-out rolls at the end of machine. The lags are heavy and run upon steel bearings. The rolls are strongly geared at both ends with our Expansion Gearing.

Both Cylinders are of solid steel blocks with crucible steel journals, made by our special process; they are slotted on all sides, carrying three knives each, and are capable of taking very heavy cuts.

The Pressure Rolls before the top cylinder are sectional, to allow two pieces of unequal thickness to be planed at the same time, and are provided with levers at the operator's end for raising either roll independently, to enter pieces when considerable difference in thickness occurs.

Sectional Weighted Chip Breakers are applied before the cut of top cylinder.

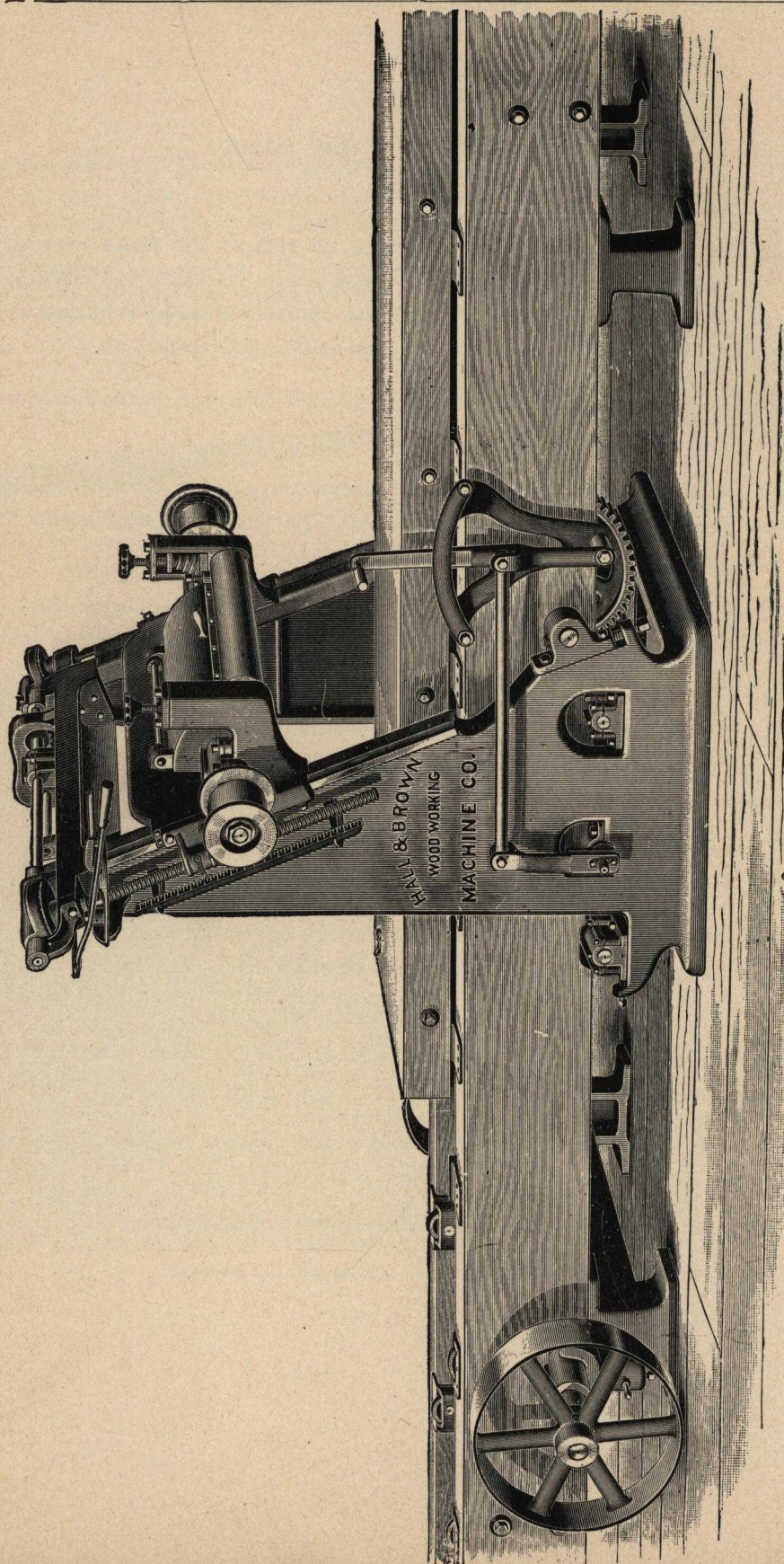
The Side Spindles are extra heavy, with three bearings, the top box being removable; they carry square heads slotted on four sides, and are fitted with our Weighted Expansion Chip Breakers.

By use of the power hoist the machine is quickly changed while running, so that timber of various sizes can be planed without sorting.

The feed is very powerful and under perfect control of the operator. Ample belt power is secured by the wide-faced pulleys used.

All cutter-heads can be readily connected to shaving spouts or conveyors.

Large bearings with self-oiling boxes are used throughout the machine.



GIANT DIMENSION PLANER.

Works 30 Inches Wide and 24 Inches Thick. Can Be Built Any Length Required.
With Quick Return Feed and Power Hoisting Attachment for Cylinder.

Giant Dimension Planer.

We have recently designed and perfected this Machine for squaring and truing up timber of large dimensions.

Its construction throughout is of the most substantial character, and many valuable improvements over former Machines of its class have been introduced.

The central iron frame work carries all working parts of the Machine, and the cutter-head, feed works, etc., are thus upon a substantial foundation.

The ways are dependent for support upon the iron work, and not *vice versa*, as has been the case in machines constructed heretofore.

A powerful feed with quick return motion is provided.

The cutter-head is made by our special process with forged steel body and crucible steel journals of large diameter running in long boxes connected by a heavy yoke. It is square, slotted on four sides, and cutters can be attached for chamfering, beading, etc. Suitable pressure rolls are placed before and after the cut.

The entire cutter-head attachment is raised or lowered by power.

All bearings are provided with self-oiling boxes and all parts are readily accessible for oiling.

The idler-trucks, on which the platen travels, reduces the friction to a minimum.

Cutter head pulleys are 6 inches diameter for 5 inch belts.

Tight and (patent self-oiling) Loose Pulleys are 16 inches diameter and 10 inch face and should make 1,000 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 10 inches wide; in length to suit from line shaft.

Two Cylinder Belts, 20 feet long, each, 6 inches wide.

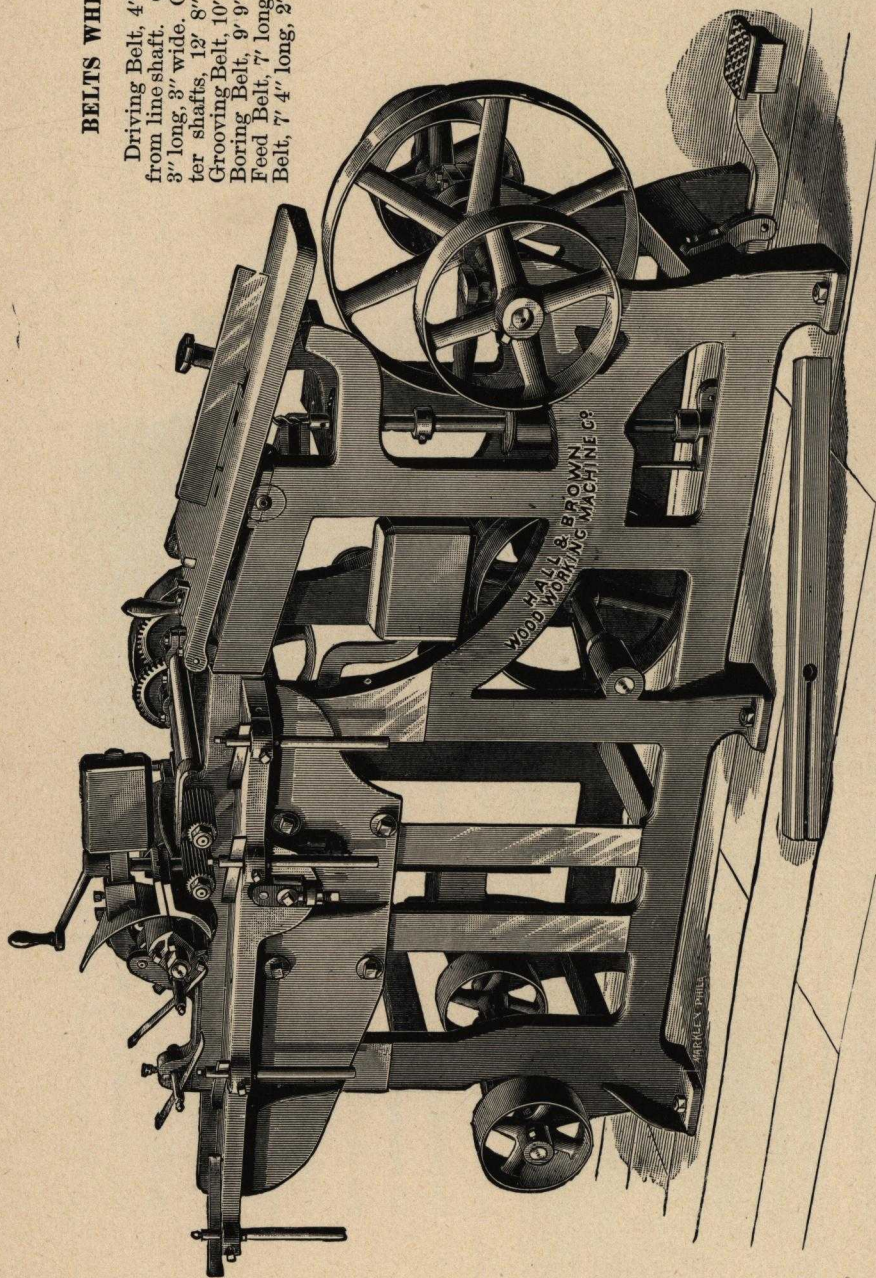
One Feed Belt, 18 feet long, 4 inches wide.

One Feed Belt, 14 feet 3 inches long, 4 inches wide.

Two Hoisting Belts, 12 feet 6 inches long, 1½ inch wide.

BELTS WHEN ORDERED.

Driving Belt, 4" wide, in length to suit from line shaft. One Top Head Belt, 11' 3" long, 3" wide. One Belt between counter shafts, 12' 8" long, 2½" wide. One Grooving Belt, 10' 1" long, 2¼" wide. One Boring Belt, 9' 9" long, 2¼" wide. One Feed Belt, 7' long, 2¼" wide. One Feed Belt, 7' 4" long, 2" wide.



SASH STICKER WITH PLOUGHING AND BORING ATTACHMENT.

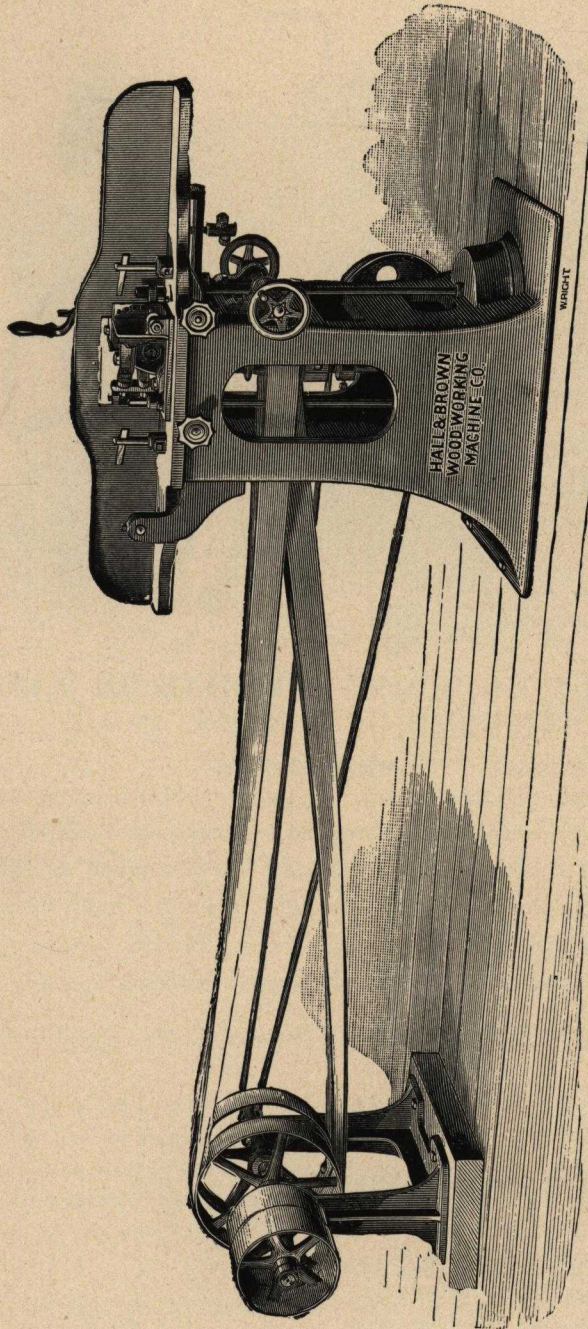
Weight, 1,400 lbs.

This Machine is used as a sash sticker, with ploughing and boring attachment for ploughing and boring sash stiles at the same time they are being run through the Machine.

The stiles are placed on the grooving table and pushed forward to the first stop, then by placing the foot on the treadle, boring the stile at the same time the first stop is being dropped below the table; then by removing the foot from the treadle, the bit drops down out of the way, and the stile is pushed forward to the second stop, thus completing the groove, as shown on sample of work at the base of the Machine. The stile is now ready to be placed under the feed rolls and run through the Machine.

The grooving and boring attachment does not interfere with the other working parts of the Machine.

Tight and Loose pulleys 10 inches in diameter, 4 inch face, and should make 900 revolutions per minute.



PANEL RAISER.

Weight, 900 lbs.

This machine is simple in design and substantial in its framing, and will work panels on one or both sides at a time. The peculiar form of cutters gives them a drawing cut, working readily on either hard or soft woods, and so smoothly that the work needs no further preparation for painting. The machine is provided with new combination heads, which admit of changing the moulding cutters so as to produce shoulder bevel or O. G. on the panel as desired, without disturbing the other cutters.

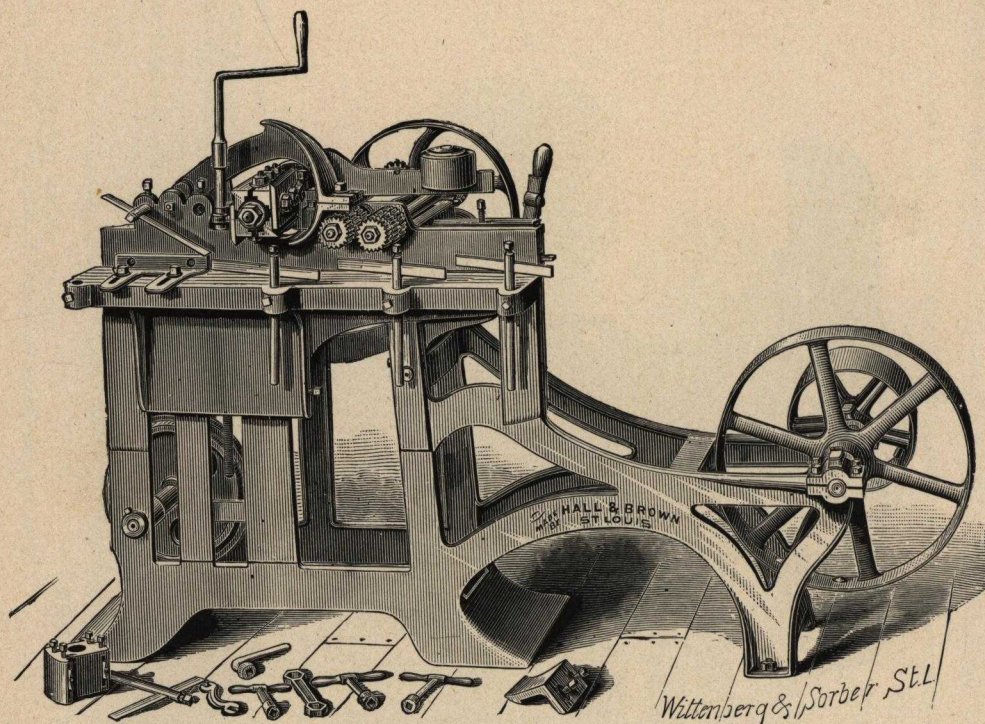
The heads and the headstocks are adjustable vertically and laterally; can also be set on any angle ever required. It is also provided with two feed rolls, and no care has been wanting to make this machine all that could be desired.

Tight and Loose Pulleys are 10 inches in diameter and 4 inch face and should make 900 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 3½ inches wide, in length to suit from line shaft.

Two Spindle Belts, in length to suit from counter-shaft.



No. 1. 6-INCH ONE SIDE MOULDING MACHINE OR SASH STICKER.

Table Drops 18 Inches.

Weight, 825 lbs.

The illustration represents our 6-Inch One Side Moulder. It is used for planing up to 6 in. wide, and as the table lowers some 16 inches, it is adapted for planing and grooving door rails, stiles, etc. The frame is cast in one solid piece, and therefore rigid and firm. It is extensively used as a sash Sticker or for narrow mouldings, a sash or door head being furnished in addition to the 6 inch 4 slotted steel head. When a one side machine is needed it is much cheaper. The feed is strong and reliable; one set of knives for each head, and all the necessary wrenches are furnished.

The tight and loose pulleys are 10 in. diameter and $4\frac{1}{2}$ inch face, and should make 850 revolutions a minute

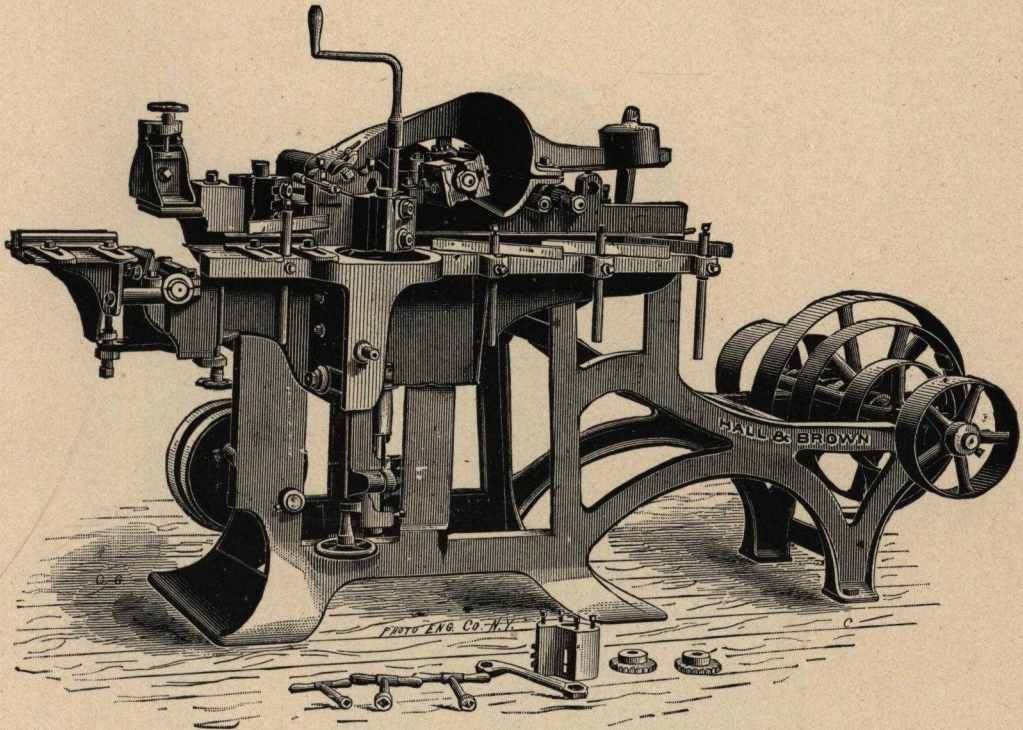
BELTS WHEN ORDERED.

Driving Belt, 4 inches wide, in length to suit from line shaft.

Top Head Belt, 11 feet 2 inches long, 4 inches wide.

Outside Feed Belt, 7 feet 4 inches long, 2 inches wide.

Inside Feed Belt, 11 feet 2 inches long, $1\frac{1}{2}$ inches wide.



No. 2. FOUR INCH FOUR SIDES MOULDER.

Table Drops 18 Inches. Weight, 1100 lbs.

The above cut represents our 4 inch 4 side Moulder. The frame is cast in one solid piece, therefore is substantial and solid. This machine is used extensively for sash, blinds, doors, and light mouldings where a 4 side moulder is required to accomplish the work. The outside headstock can be set to any angle and made fast, and then moved in or out, up or down without changing the angle of the cut.

The Feed Works are strong and simple, and the feed is operated with a tightener instead of a clutch.

The table can be lowered 12 inches, and by detaching the outside headstock can be lowered 16 inches.

We furnish 4 4 inch 4 slotted Steel Heads, and an extra sash or door head with each machine; also one pair of knives for each head, including all the necessary wrenches and spur feed rolls. The cutter shafts are made of the best grade of steel and run in Babbitted boxes.

The tight and loose pulleys are 10 inches in diameter, and $4\frac{1}{2}$ inch face, and should make 850 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 4 inches wide, in length to suit from line shaft.

Top Head Belt, 11 feet 2 inches long, 3 inches wide.

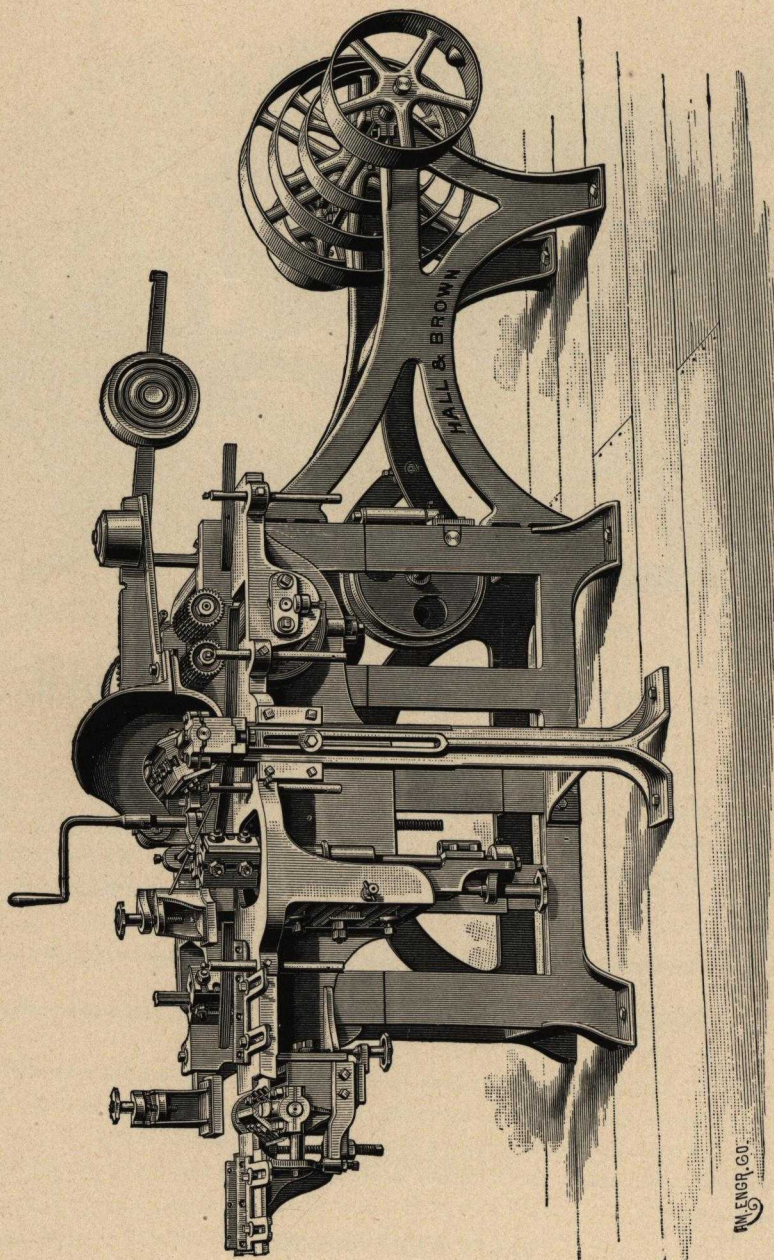
Bottom Head Belt, 13 feet 9 inches long, 3 inches wide.

Outside Head Belt, 10 feet 2 inches long, 2 inches wide.

Inside Head Belt, 11 feet 2 inches long, 2 inches wide.

Inside Feed Belt, 11 feet long, $1\frac{1}{2}$ inches wide.

Outside Feed Belt, 7 feet 2 inches long, 2 inches wide.



No. 3. 6-INCH FOUR SIDES MOULDER.

Table Drops 14 Inches. Weight, 1540 lbs.

No. 3. 6-Inch Four Sides Moulder.

The above engraving represents our new six-inch four sided Moulder. The Machine is built heavy, strong and substantial, the frame being cast in one solid piece. The table is raised and lowered 14 inches by a single screw. It will finish work on four sides 6 inches wide and 4 inches thick. It will cut and shape mouldings within these limits.

The outside bearing arm extends to the floor, and is bolted to the frame, which gives it stiffness and solidity of the Inside Moulder, without inconvenience to the operator. The box for the outside bearing can be removed easily, to remove or receive heads. It has very strong feed double top rolls. Both rolls being weighted. It also has a large friction roll in the table. A tightener is used for the feed instead of a clutch, which places the feed under the perfect control of the operator.

We send four (4) slotted steel heads and one sash and door head, with one pair of straight knives for each head with each four side machine. The outside head is adjustable vertically, or at any angle, and can be moved out or in without disturbing the angle.

All the spindles are made of the best steel, and of large size, and the boxes are lined with the best Babbitt metal.

The throat of the inside head, and the under cutter, are wide, so long cutters can project, and are provided with adjustable side pieces to close up, or act as chip breakers.

The pulleys are large and wide and the belts are long. The Tight and Loose Pulleys are 10 inches diameter, and 4½ inches face, and should make 900 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 4 inches wide, in length to suit from line shaft.

Top Head Belt, 13 feet 3 inches long, 4 inches wide.

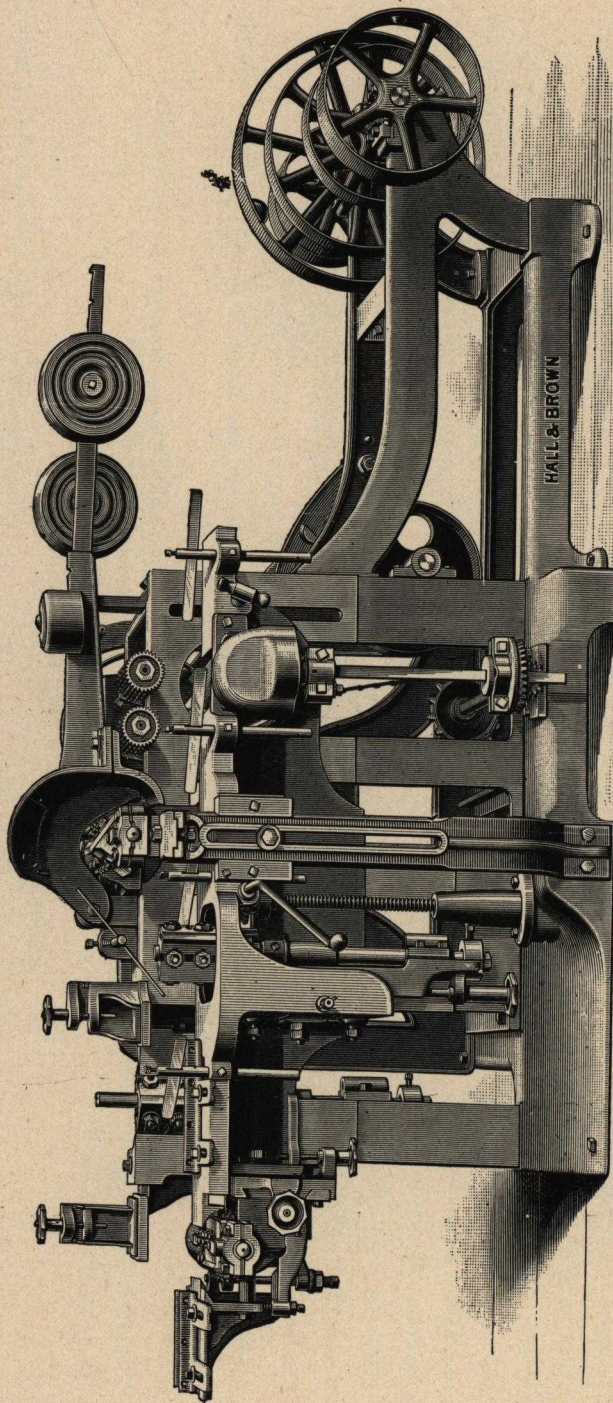
Bottom Head Belt, 16 feet 10 inches long, 3 inches wide.

Inside Head Belt, 14 feet 2 inches long, 2½ inches wide.

Outside Head Belt, 12 feet 8 inches long, 2½ inches wide.

Inside Feed Belt, 8 feet 4 inches long, 1½ inches wide.

Outside Feed Belt, 6 feet 2 inches long, 2½ inches wide.



AM. ENG. CO. STL

No. 4. IMPROVED 7-INCH 4 SIDES MOULDER.

Table Drops 14 Inches.

Weight, 2100 lbs.

No. 4. Improved 7 Inch 4 Side Moulder.

Our improved 7-inch moulder, herewith illustrated, is built from new designs and from an entire new set of patterns. It will be noticed from the cut that the base of the machine is one entire solid casting which prevents all vibration of the machine when in motion, caused by an uneven floor. The frame itself is cast in one piece and planed off on the bottom; corresponding places are also planed off the top of the base upon which the frame is securely bolted, thus giving the machine a solid and substantial foundation. The outside bearing for the Top Head is then bolted securely to the base of the machine. The box that supports the end of the top Cutter Head Shaft, being dove-tailed to the upright stand, and secured by one bolt, which can be removed at pleasure to change the Heads.

The table can be raised or lowered 13 inches by a single screw. It will finish work on four sides 7 inches wide and 4 inches thick, and will make any shape moulding within these limits. We can also furnish the well-known Shimer Heads with this machine for flooring or ceiling, if desired. It has a strong and powerful feed consisting of three driven rolls, the two top rolls being weighted separate and independent of each other. Provisions are made for long and wide belts with plenty of clearance. A tightener is used to stop and start the machine instead of a clutch, which places the feed under the perfect control of the operator. Both the top and bottom Heads have a horizontal adjustment. The bottom head is also adjusted vertically; both the side heads have a horizontal, vertical and angular adjustment.

We furnish with each machine four (4) slotted Steel Heads with steel bolts and nuts with one pair of straight knives for each head. Spur feed rolls, and all the necessary wrenches are furnished with the machine. The steel slotted heads are made from a solid forging and are not cast. All shafts upon the machine are of steel, and the cutter head spindles are made of the best quality of crucible steel and the boxes lined with the best genuine babbit metal. The space about the inside and under heads are wide so that long bits can project. The machine is always provided with adjustable side pieces to close up the space in front of heads when not required, and at the same time to act as chip breakers.

The tight and loose pulleys are 10 inches in diameter and 5½ inch face, and should make 900 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt 5 inches wide, in length to suit from line shaft.

Top Head Belt 13 feet 5 inches long, 4½ inches wide.

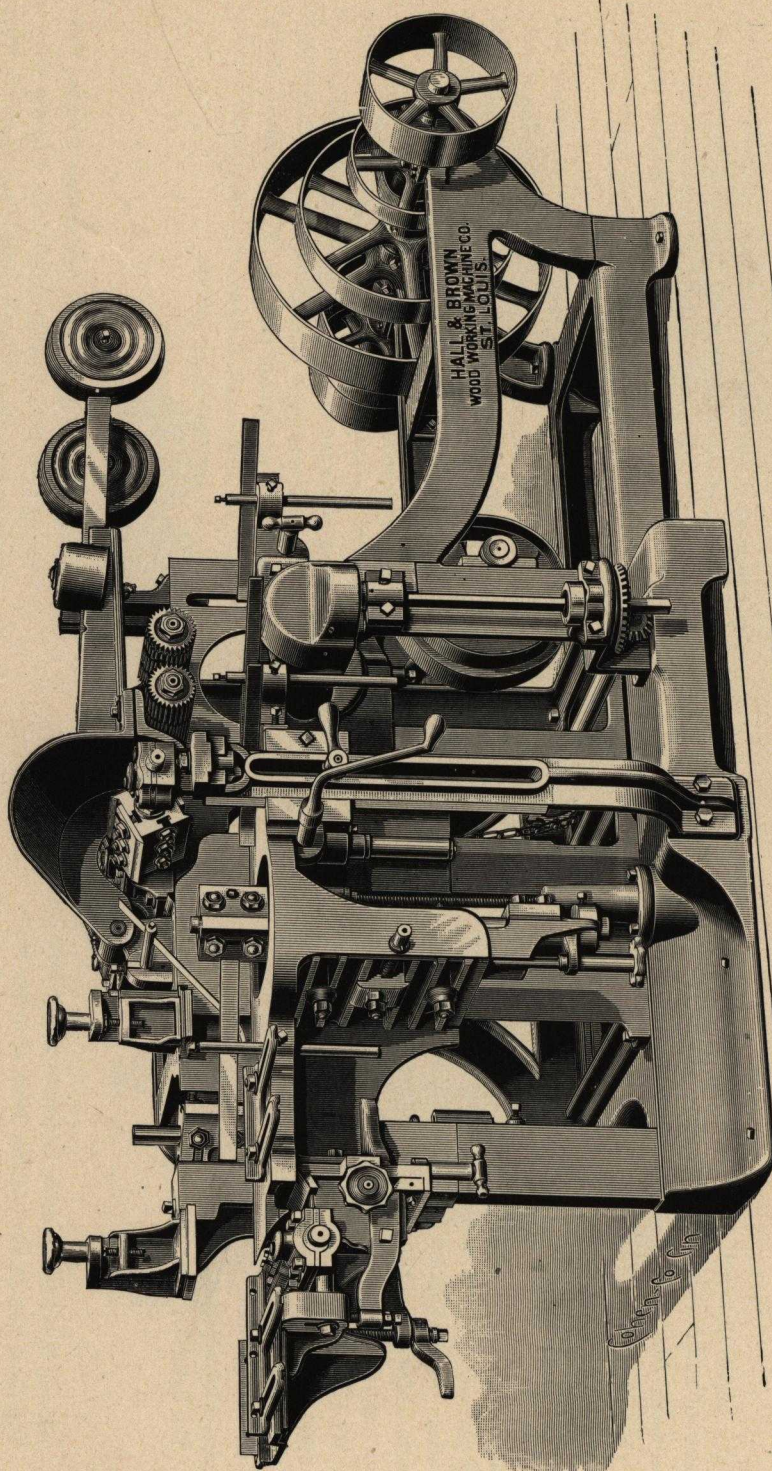
Bottom Head Belt 16 feet 9 inches long, 3 inches wide.

Inside Head Belt 14 feet long, 2½ inches wide.

Outside Head Belt 12 feet 4 inches long, 3 inches wide.

Inside Feed Belt, 7 feet 9 inches long, 2 inches wide.

Outside Feed Belt, 6 feet 6 inches long, 2½ inches wide.



No. 5. IMPROVED 8-INCH 4 SIDES MOULDER.

Table Drops 14 Inches. Weight, 2500 lbs.

No. 5. Improved 8 inch 4 Sides Moulder.

It will be noticed from the cut that the base of the machine is one entire solid casting which prevents all vibration of the machine when in motion, caused by an uneven floor. The frame itself is cast in one piece and planed off on the bottom; corresponding places are also planed off the top of the base upon which the frame is securely bolted, thus giving the machine a solid and substantial foundation. The outside bearing for the Top Head is then bolted securely to the base of the machine. The box that supports the end of the top Cutter Head Shaft, being dovetailed to the upright stand, and secured by one bolt, which can be removed at pleasure to change the Heads.

The table can be raised or lowered 12 inches by a single screw. It will finish work on four sides 7 inches wide and 4 inches thick, and will make any shape moulding within these limits. We can also furnish the well-known Shiner Heads with this machine for flooring or ceiling, if desired. It has a strong and powerful feed consisting of three driven rolls, the two top rolls being weighted separate and independent of each other. Provisions are made for long and wide belts with plenty of clearance. A tightener is used to stop and start the machine instead of a clutch, which places the feed under the perfect control of the operator. Both the top and bottom Heads have a horizontal adjustment. The bottom head is also adjusted vertically; both the side heads have a horizontal, vertical and angular adjustment.

We furnish with each machine four (4) slotted Steel Heads with steel bolts and nuts with one pair of straight knives for each head. Spur feed rolls, and all the necessary wrenches are furnished with the machine. The steel slotted heads are made from a solid forging and are not cast. All shafts upon the machine are of steel, and the cutter head spindles are made of the best quality of crucible steel and the boxes lined with the best genuine babbit metal. The space about the inside and under heads are wide so that long bits can project. The machine is always provided with adjustable side pieces to close up the space in front of heads when not required, and at the same time to act as chip breakers.

The tight and Loose Pulleys are 10 inches in diameter, and 6 inch face, and should make 850 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt 6 inches wide, in length to suit from line shaft.

Top Head Belt 13 feet 5 inches long, 4 inches wide.

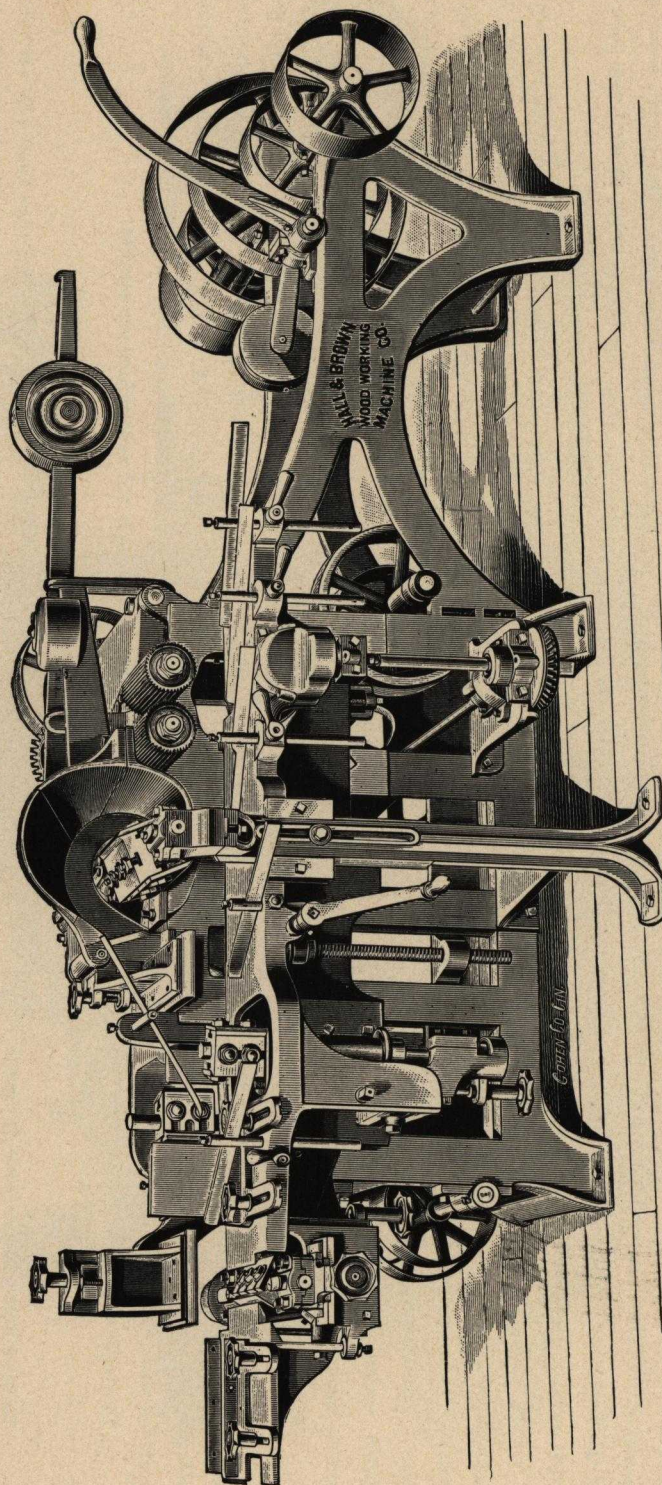
Bottom Head Belt 16 feet 9 inches long, 3 inches wide.

Inside Head Belt 14 feet long, 2½ inches wide.

Outside Head Belt 12 feet 4 inches long, 3 inches wide.

Inside feed Belt 7 feet 9 inches long, 2 inches wide.

Outside Feed Belt 6 feet 6 inches long, 2½ inches wide.



No. 6. 9 INCH 4 SIDE MOULDER.

Weight, 3400 Pounds.

Table Drops 12 Inches.

No. 6. 9 Inch 4 Side Moulder.

This is a very powerful machine and is capable of cutting any kind of moulding not exceeding 9 inches in width and 4 inches in depth. It will dress on four sides, flooring, ceiling, planing and matching up to 9 inches wide; we also desire to call your attention to the long belts, which are very important in a machine of this class.

The feed arrangement is strong and powerful, consisting of two large top rolls and one bottom roll, all being driven, the top rolls always resting level on the lumber. The outside and inside vertical headstocks are both adjustable and can be moved to any angle or position desired. The throats for the bottom and inside heads to work in while using long projecting knives, are provided with adjustable slide pieces to close up the throat and operate as chip breakers, when ordinary work is being accomplished. The portion of the table carrying the underhead is vertically adjustable by means of a single screw, and the underhead is also adjustable endwise, and entirely accessible. It has an outside bearing for the top Cutter Head which extends to the floor, thus giving it the solidity of the inside moulders, without inconveniencing the operator in the least. The outside box can be removed at pleasure to remove and receive the heads.

The Crank for raising and lowering is placed in front of the machine and the table can be raised or lowered without inconvenience, while the machine is in motion. A tightener is used on the feed instead of a clutch, which is controlled better on heavy work. The spring posts are secured with hand nuts and held in position more firmly than with set screws.

We send four 4-sided slotted steel heads and one solid slot head, and one set knives for each head, with each four-side machine, including one Set Spur, Feed Rolls and all the necessary wrenches.

The tight and loose Pulleys are 14 inches in diameter and 8 inch face and should make 800 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt 7 or 7½ inches wide, in length to suit from line shaft.

Top Head Belt 15 feet 9 inches long, 5 inches wide.

Bottom Head Belt 20 feet 4 inches long, 3 inches wide.

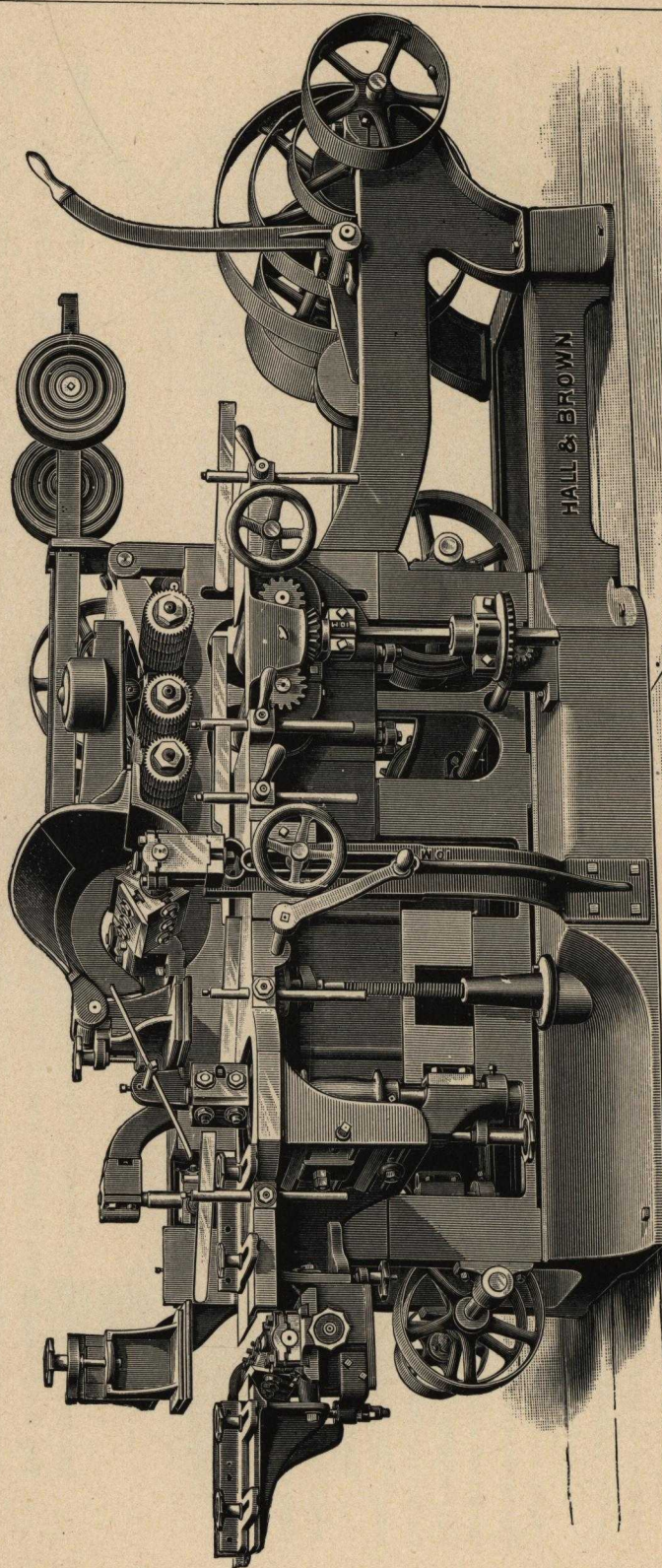
Inside Head Belt 16 feet 9 inches long, 3 inches wide.

Outside Head Belt 16 feet 2 inches long, 3 inches wide.

First Feed Belt 10 feet 2 inches long, 2 inches wide.

Second Feed Belt 11 feet 8 inches long, 4 inches wide.

Outside Feed Belt 12 feet 10 inches long, 4 inches wide.



No. 7. IMPROVED 10 INCH 4 SIDE MOULDER.

Weight, 4150 Pounds. Table Drops 12 Inches.

AMERICAN
MACHINE CO.

No. 7. Improved 10 Inch 4 Side Moulder.

The recent improvements with the previous well-known qualities of our 9 and 10 inch Moulder, renders this machine superior to any ever offered to the public. The base upon which the machine rests is cast in one solid piece, and planed off upon the top. The frame is also in one piece and the bottom of the frame planed off to correspond and then securely bolted to the base, thus securing a solid foundation for the frame. It is also the heaviest machine of the kind made and is especially adapted to a large range of work. It will work any moulding not exceeding 10 inches in width, and will dress on four sides four inches thick, and by using the celebrated Shimer Heads it will work flooring or ceiling to perfection and will tongue and groove 10 inches wide. The support for the outside bearing for the top Cutter Head Shaft is securely bolted to the solid base of the machine; this support is planed off on the sides and gibbed to the table and held firmly in place by the hand wheel shown in cut. The box which supports the top head shaft is dove-tailed to the upright, and can be removed at pleasure when required. The table is securely gibbed to the frame and is raised or lowered 12 inches by one large square thread screw, operated by the crank handle shown. The front or feeding end of the table is securely clamped to the frame when in use by the hand wheel shown, possessing all the advantages of an inside moulder, and is superior for the convenience of the operator. The feed is very strong and powerful, consisting of five driven rolls, three above and two below the table; the three upper rolls are heavily weighted and so constructed that they work at all times parallel with the bed, thus giving them an equal bearing and full width of the lumber. It does not affect the feed gearing which drives the lower rolls, in the least, by lowering the table to its full capacity. The feed works are operated by a tightener, easily controlled by the operator. The top head has a horizontal adjustment, the bottom and both outside and inside heads are adjustable, horizontally and vertically. The outside and inside head can be set at any angle and fastened and then moved to or from the work, or vertically without changing the angle in the least.

Ample space around the heads has been provided for to admit of using special bits, in doing certain classes of work, and have abundant space for long bits to revolve. Both the bottom and inside heads are provided with adjustable slide pieces to close up the space and act as chip breakers when desired. We use Steel Shafting throughout; the Cutter Head Shafts are large size and made from a superior quality of crucible steel, and all boxes are lined with the best genuine babbit metal.

We furnish for the Counter Shaft which is attached to the machine, a self-oiling loose pulley. The Counter Shaft is also supplied with an outside bearing or support outside of the loose pulley.

We furnish with each machine four 4-slotted Steel Heads with steel bolts and nuts, and one pair of Straight Knives for each head, also one extra set of Spur Feed Rollers, and the necessary wrenches for the machine. Our steel heads are all made from solid forgings and not cast. The tight and loose Pulleys are 14 inches in diameter and 8½ inch face and should make 800 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 8 inches wide, in length to suit from line shaft.

Top Head Belt, 15 feet 11 inches long, 5 inches wide.

Bottom Head Belt, 20 feet 6 inches long, 3½ inches wide.

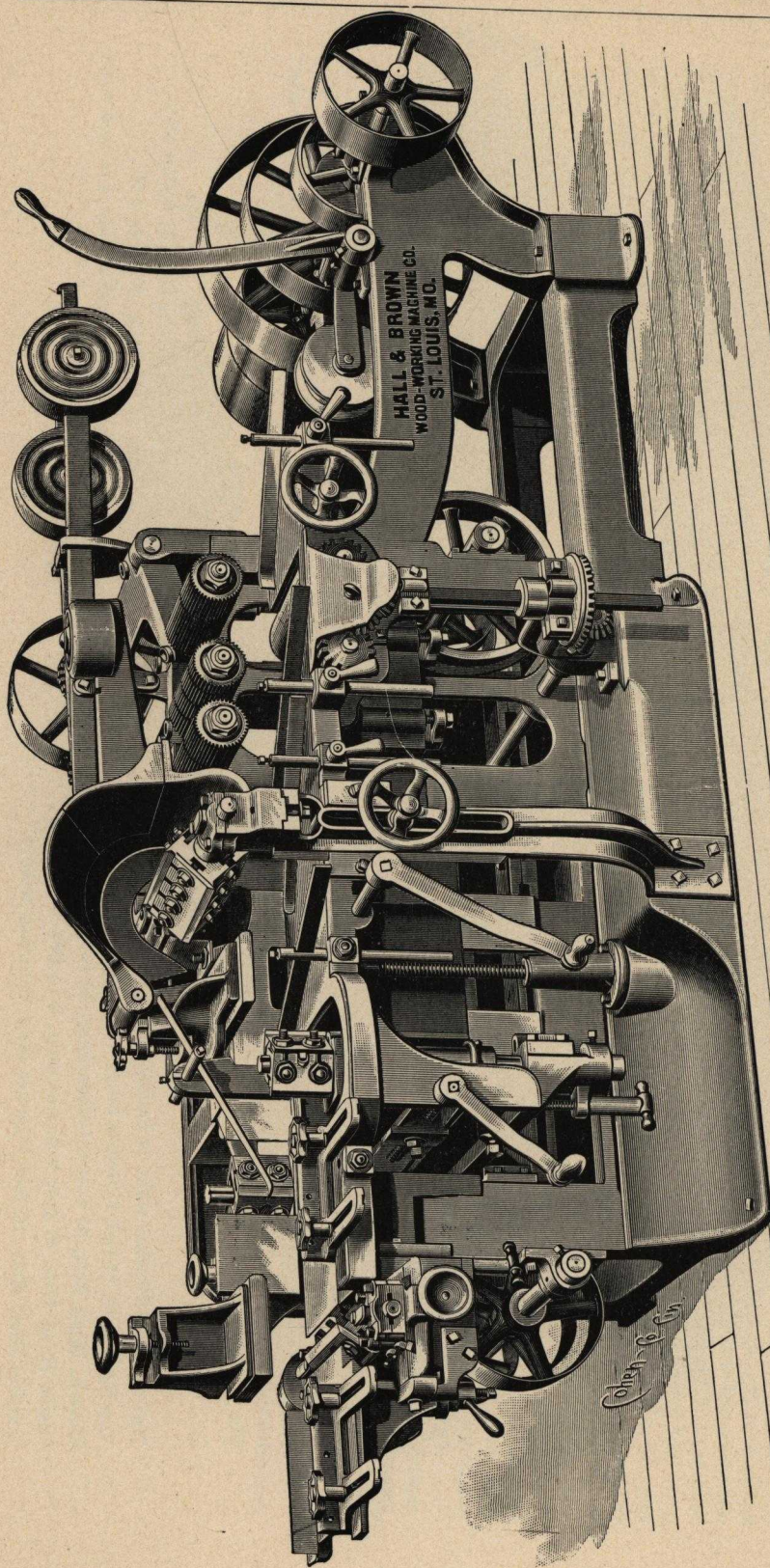
Inside Head Belt, 17 feet 2 inches long, 3 inches wide.

Outside Head Belt, 16 feet 5 inches long, 3 inches wide.

Tightener Belt, 9 feet 2 inches long, 2½ inches wide.

Inside Feed Belt, 13 feet long, 4 inches wide.

Outside Feed Belt, 14 feet 2 inches long, 4 inches wide,



No. 8. 12 INCH 4 SIDE MOULDER.
Weight, 4400 Pounds. Table Drops 12 Inches.

No. 8. 12 Inch 4-Side Moulder.

The illustration on opposite page represents our 12 inch 4-side Moulder. Its general design and construction is similar to our 10 inch Machine illustrated and described on the two preceding pages.

The base upon which the Machine rests is cast in one solid piece, and planed off upon the top. The frame is also in one piece and the bottom of the frame planed off to correspond and then securely bolted to the base, thus securing a solid foundation for the frame.

The Machine will work on all four sides 12 inches wide and 4 inches thick. The table can be lowered so that it will work on two sides 12 inches thick. By using the celebrated Shimer Heads it will work flooring, ceiling or make ship-lap to perfection, and will tongue and groove 12 inches wide.

The support for the outside bearing for the Top Cutter Head Shaft is securely bolted to the solid base of the Machine; this support is planed off on the sides and gibbed to the table and held firmly in place by the hand-wheel shown in cut. The box which supports the top Head Shaft is dove-tailed to the upright and can be removed at pleasure when required. The table is securely gibbed to the frame and is raised or lowered 12 inches by one large square thread screw, operated by the crank handle shown. The front or feeding end of the table is securely clamped to the frame when in use by the hand-wheel shown, possessing all the advantages of an inside Moulder, and is superior for the convenience of the operator. The Feed is very strong and powerful, consisting of five driven rolls, three above and two below the table; the three upper rolls are heavily weighted and so constructed that they work at all times parallel with the bed, thus giving them an equal bearing the full width of the lumber. It does not affect the feed gearing which drives the lower rolls, in the least, by lowering the table to its full capacity. The feed works are operated by a tightener easily controlled by the operator. The top head has a horizontal adjustment, the bottom and both outside and inside heads are adjustable, horizontally and vertically. The outside and inside head can be set at any angle and fastened and then moved to or from the work, or vertically without changing the angle in the least.

Ample space around the Heads has been provided for to admit of using special bits, in doing certain classes of work, and have abundant space for long bits to revolve. Both bottom and inside heads are provided with adjustable slide pieces to close up the space and act as chip breakers when desired. We use steel shafting throughout; the cutter head shafts are large size and made from a superior quality of crucible steel, and all boxes are lined with the best genuine babbitt metal.

We furnish for the counter shaft which is attached to the Machine, a self-oiling loose Pulley. The counter shaft is also supplied with an outside bearing, or support outside of the loose Pulley.

We furnish with each Machine four 4-slotted steel heads, with steel bolts and nuts, and one pair of straight knives for each head, also one extra set of spur feed rollers, and the necessary wrenches for the Machine. Our steel Heads are all made from solid forgings and not cast.

The Tight and Loose Pulleys are 14 inches in diameter, and $8\frac{1}{2}$ inch face and should make 800 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 8 inches wide, in length to suit from line shaft.

Top Head Belt, 15 feet 11 inches long, 5 inches wide.

Bottom Head Belt, 20 feet 6 inches long, $3\frac{1}{2}$ inches wide.

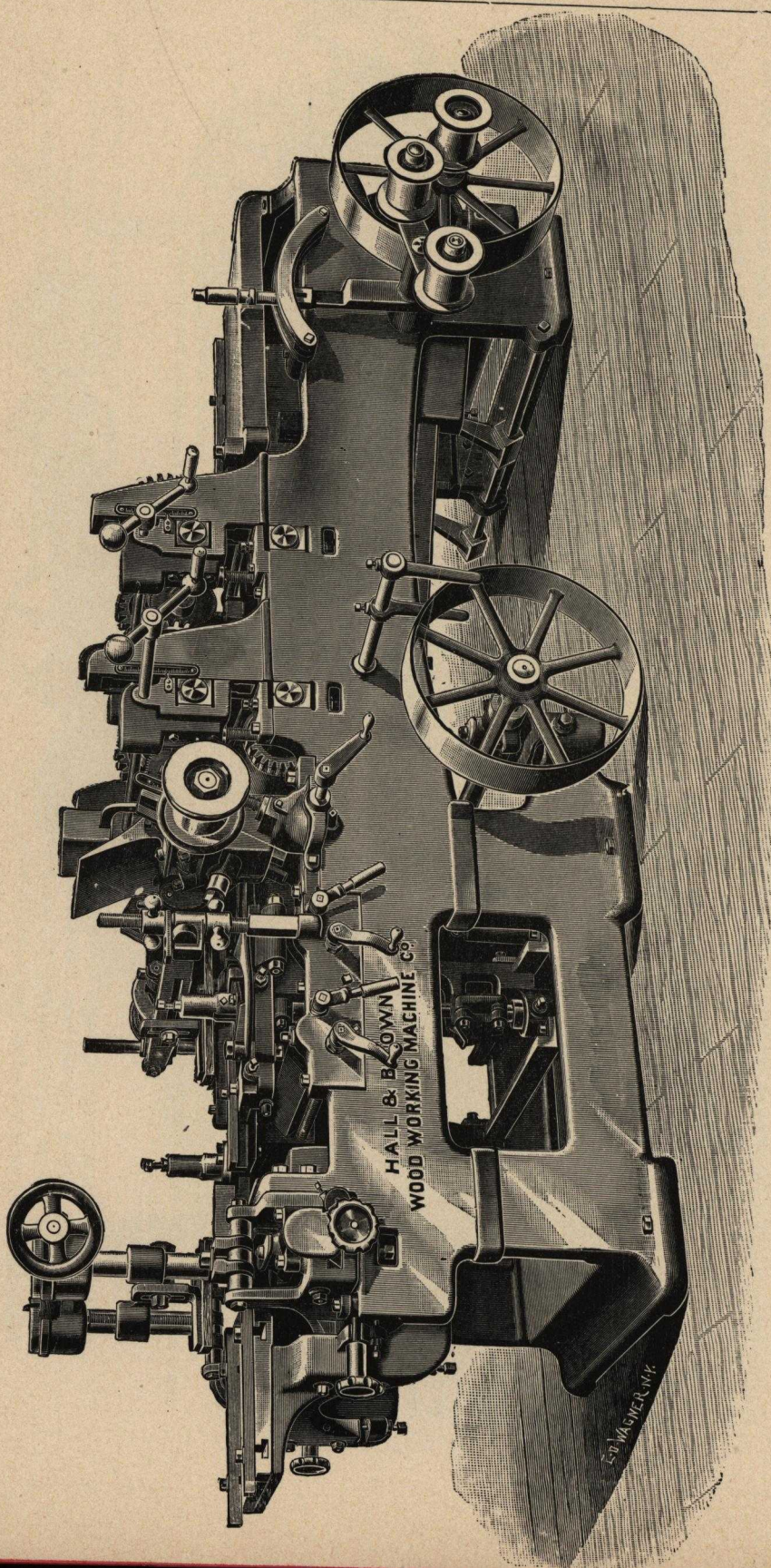
Inside Head Belt, 17 feet 2 inches long, 3 inches wide.

Outside Head Belt, 16 feet 5 inches long, 3 inches wide.

Tightener Belt, 9 feet 2 inches long, $2\frac{1}{2}$ inches wide.

Inside Feed Belt, 13 feet long, 4 inches wide.

Outside Feed Belt, 14 feet 2 inches long, 4 inches wide.

**INSIDE MOULDER.**

Weight of 9-Inch, 5100 lbs.

Weight of 12-Inch, 5600 lbs.

Weight of 15-Inch, 6100 lbs.

Inside Moulder.

Made to Work 9, 12 and 15 Inches Wide.

This Machine is designed with special reference to strength and solidity where it is most needed.

The Feed Rollers are geared on both ends by a train of smooth running gears, the two lower expansion gears are fast to the shaft running in bearings cast to the roller stands, the two top expansion gears run idle on the top shaft, and is fitted with improved oiling devices, by which means all shafts and loose gears can be oiled while the Machine is running.

The top cutting cylinder stand has lateral adjustments by means of a screw working into the frame, the stand is especially heavy to absorb all vibration, the bearings are fitted on to face of stand with tongue and groove, and are scraped to get a perfectly true seat and to clamp unto the stand.

The bearings for top and bottom cutter heads are large (2 inches in diameter, 10 inches long), made of a special fine grade of steel, the cutter heads are slotted on all four sides for extra large bolts. The Chip Breaker before the cut of top head is sectional, and has adjustments to and from the cylinder, is convenient to get at, is weighted and has shaving bonnet which can be easily removed when hood from exhaust fan is used.

The under cylinder has a vertical and lateral adjustment, independent of the tables before or after the cut, the bearings are yoked together in a massive casting which is firmly bolted to vertical flanges cast on the frame. The end table on feeding out end of Machine is pivoted to swing down giving free access to lower cutter head for sharpening or adjusting cutters, this table has a vertical and longitudinal adjustment for all kinds of deep or heavy cutting. The pressure plate over this cylinder is so arranged as to be vertically over the cut and is adjusted by means of screws, bevel gears and hand wheel, which will hold it firmly in place insuring a perfectly steady hold-down and consequently extra smooth work.

Each side head spindle has separate lateral adjustment. Either one or both of the Matcher spindles can be made to angle. The left hand Matcher leg is fitted on top with an improved matcher plate carrying an expansion weighted chip-breaker before the cut, and take up guide arrangement after the cut, allowing a large swing for all kinds of moulding cutters, and they can be set close to the cut for fine ceiling or flooring. The long guide is made of one continuous piece of wrought iron and is fitted on its ends with expansion throat piece, and firmly bolted to an extension of the plate on the right hand Matcher leg.

The guides from the Matchers to the feeding out end of the Machine are all fitted with lateral and longitudinal adjustment and can be easily set while the Machine is running, without risk to the operator.

Top feed rollers are fitted with pull-out shafts for changing rollers and fluted, smooth, sectional, spur, or any kind of feed rollers may be used as desired.

The feed is stopped and started by means of a belt tightener.

The Machine is furnished with one pair of mortised matcher heads and one pair of four-sided slotted steel jointer heads for moulding cutters and all necessary wrenches, &c.

Tight and Loose Pulleys are 14 inches in diameter and 6 inch face and should make 800 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 6 inches wide, in length to suit from line shaft.

Two Top Head Belts, 17 feet long each, 4 inches wide.

One Under Head Belt, 22 feet 8 inches long, 4 inches wide.

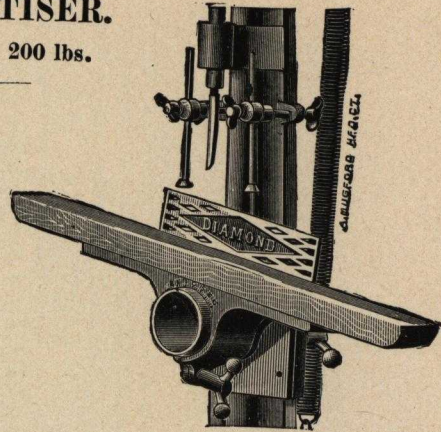
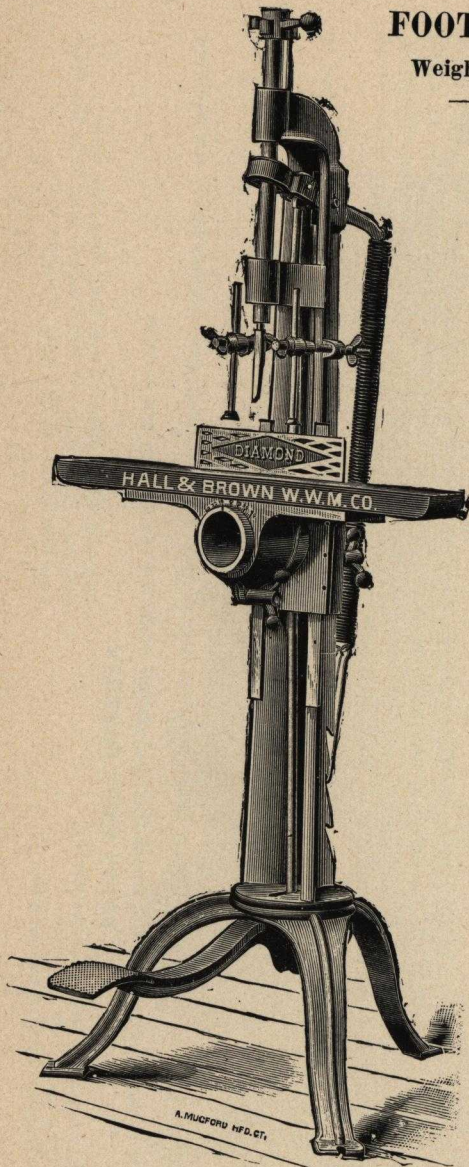
One Side Head Belt, 19 feet long, 3 inches wide.

One Side Head Belt, 17 feet 6 inches long, 3 inches wide.

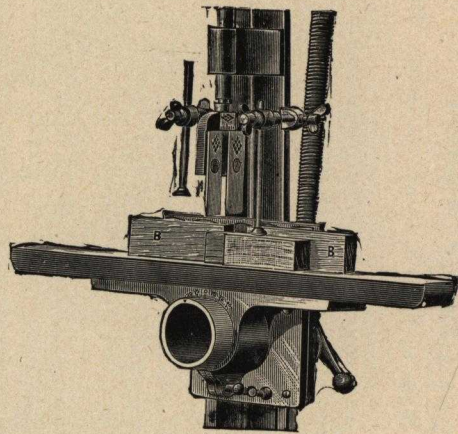
One Feed Belt, 15 feet long, 3 inches wide.

FOOT MORTISER.

Weight, boxed, 200 lbs.



This cut shows the Table Tilted for cutting work on an angle. It can be tilted either way, to the right or left, and to any angle desired.



This cut shows the Tenoning Tool in position and Table arranged for work. The pieces B. B. are $\frac{3}{4}$ strips, secured to back of table, leaving a small opening in the center for the passage of the Tool.

This Machine is strong and substantial, has powerful motion, accurate action, large range for work, and in all respects is the most perfect Foot Power Mortising Machine ever offered.

It is made entirely of iron and steel, except the hardwood strip on top of table, and the novel construction of the frame renders it extremely strong and solid.

The treadle motion is arranged in such a manner as to obtain great leverage and power on the Chisel Spindle, without special strain on the working parts.

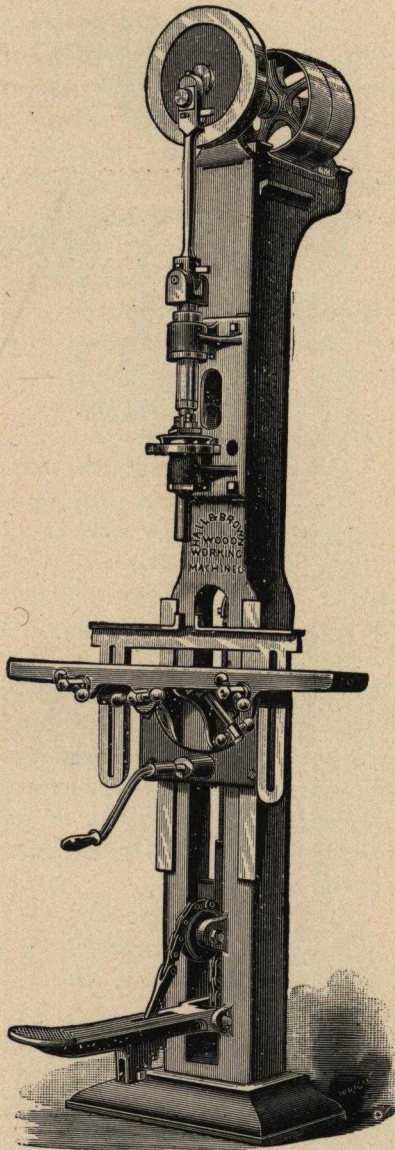
The Table has easy, accurate and positive, horizontal, vertical and angle adjustments. The angle adjustment is a valuable feature that will be appreciated by all mechanics. It is provided with a graduated scale by which the operator may tilt the table either to the right or left to mortise or cut work on any desired angle.

It has a heavy coiled wire spring made of best spring steel, oil tempered, which can be easily adjusted for any desired tension.

The Chisel Reverser is attached to the upper end of the Chisel Spindle. The working points are milled to a gauge, and it is provided with a stop, in such a manner as to secure perfect accuracy in reversing the chisel.

It will mortise $\frac{1}{4}$ to 1 inch wide, 3 inches deep, and with the addition of the Diamond Tenoning Tool, cut Tenons $\frac{1}{4}$ to $\frac{3}{4}$ inch thick, 3 inches wide.

Each machine is provided with three Mortising Chisels, one each $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{5}{8}$ inch. Other sizes may be substituted if desired.

No. 1. IMPROVED SASH MORTISER.**Weight, 730 lbs.**

This Engraving represents our No. 1 Sash Mortiser. It is used principally on Sash and Blind Work, but is capable of doing all kinds of light Mortising. As it is a well built, substantial Machine, the connection spindle, straps and reverse are made of steel with extra heavy stops on the reverse, so that there is no danger of the same breaking off. The reversing arrangement is simple, positive and not liable to get out of order.

We claim as an improvement the conical brass boxes in which the quill and spindle run, and the mode by which the speed of the reverse is reduced to prevent the breakage of the stops on the reverse, which operators know has heretofore been a bad feature on all Mortising Machines.

Our conical Brass Boxes are split and fitted in to conical bearings. The larger or quill brass has a thread cut on the lower end, with a nut on to take up the wear of the brass, and the smaller or spindle brass is held with clamp and jam nuts to take up the wear in it. The reverse is also conical, with nut on the small end for taking up the wear on same. Any mechanic will see at once that it is impossible for the spindle to be thrown out of line.

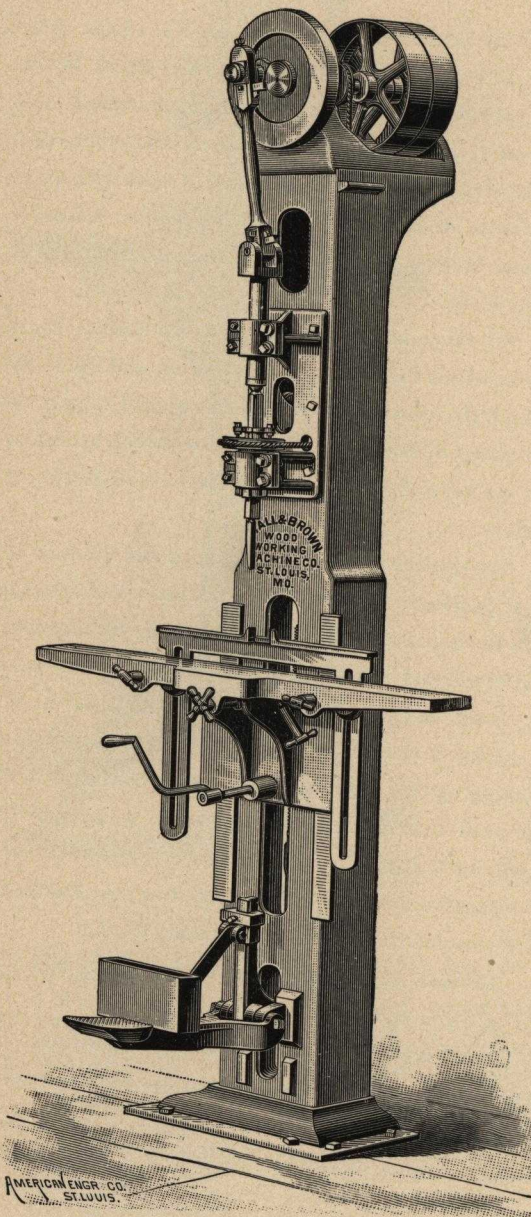
There is no re-babbitting needed on this Machine. It will run for years without requiring repairs.

All these Machines are built with tilting table so as to be set on an angle.

There are a large number of these Machines in use throughout the country, and they are acknowledged to be the best.

We furnish five chisels with each Machine, unless otherwise ordered, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$ and $\frac{1}{2}$ inch.

Tight and Loose Pulleys are 10 inches in diameter and 3 inch face and should make 600 revolutions per minute.

No. 2. IMPROVED DOOR, SASH AND BLIND MORTISER.**Weight, 1150 lbs.**

This machine is used principally for mortising doors, sash, blinds and many other classes of work where it does not require boring in advance of the chisel; much more work can be accomplished without boring when the class of work will permit.

The Machine is built very strong and substantial, and the crank is well balanced to withstand the strain occasioned by the continual thrust of the chisel.

The reversing arrangement is automatic, positive and simple.

The reverse pulley which reverses the chisel is made of steel and is bushed with a gun-metal sleeve which can be adjusted to take up all lost motion when worn, it being well-known that imperfect work is the sure result of a loose chisel holder or spindle.

The quill or slide, also the connection straps and keys are all made of steel.

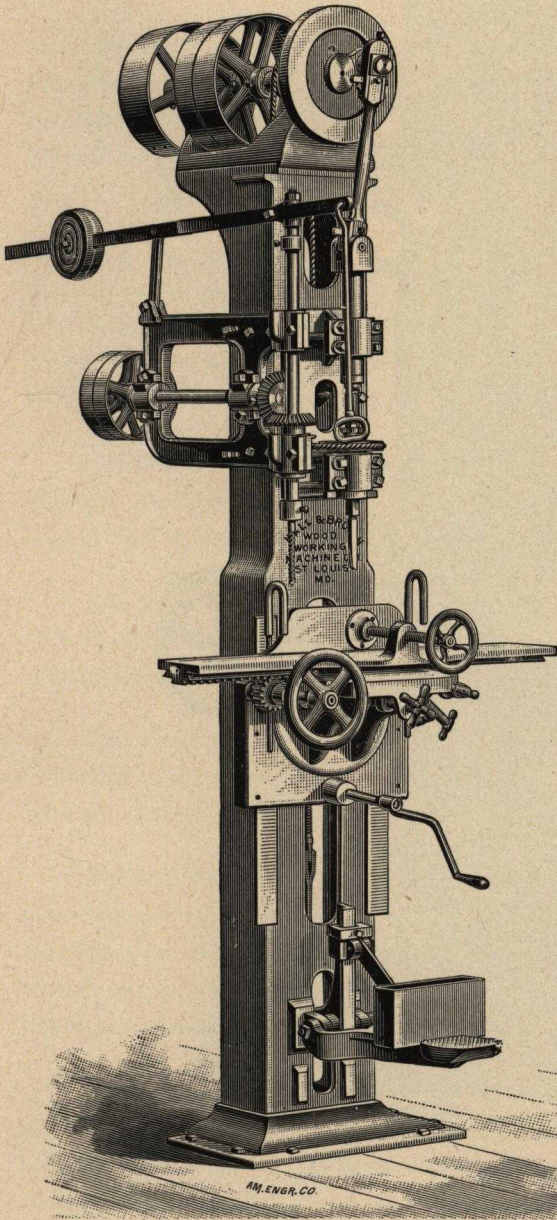
The lower box containing the reverse, and the upper box containing the quill or slide is cast together or connected then planed off and bolted securely to the frame.

The box containing the quill or slide is made in two parts which can be adjusted in case of wear to take up all lost motion sidewise.

The table or bed is adjusted to or from the frame to suit the position of the mortise, also vertically for regulating the depth.

Each Machine is furnished with five chisels.

The tight and loose pulleys are 12 inches in diameter and $3\frac{1}{2}$ inches face, and should make from 400 to 500 revolutions per minute.

No. 3. IMPROVED CABINET MORTISER.**Weight, 1300 lbs.**

The Mortiser here illustrated is intended especially for Furniture and Car Factories, Wagon and Agricultural Works, where the material to be mortised is principally hard wood.

The Machine is provided with a boring attachment which is placed upon a line with the chisel.

The table is also provided with a clamp for clamping the material, the piece to be bored and mortised can then be moved forward to the bit or chisel by the hand wheel shown in cut, without releasing it from its position.

The bed or table is also adjustable to and from the column to suit the position of the mortise desired, also vertically for regulating the depth.

The boring attachment or clamp is seldom used except on hard wood or large mortises, and they can be used or not at will.

The table is so arranged to allow of mortising on an angle and can be swung to the right or the left to an angle of 45 degrees.

The Machine is built very strong and substantial, and the crank wheel well balanced to withstand the severe strain occasioned by the continual thrust of the chisel. The reversing arrangement for reversing the chisel is automatic, positive and simple.

The reverse Pulley which reverses the chisel is made of steel and is provided with a tapered gun-metal sleeve so that all wear or lost motion can be taken up, it being well-known that imperfect work is a sure result of a loose chisel holder or spindle.

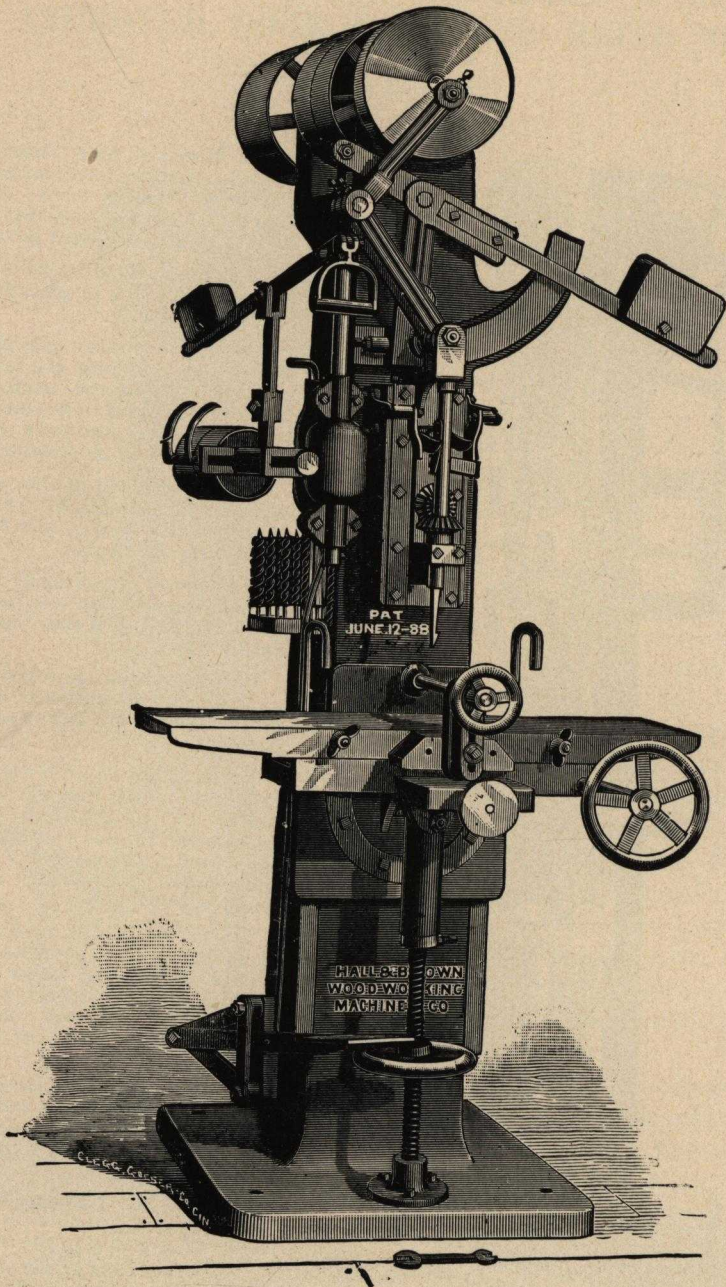
The Quill, Pitman, Straps and Keys, in fact all the working parts are made of steel.

The lower box in which the reverse operates for reversing the chisel, and the box containing the quill or slide are cast together or connected, planed off and bolted firmly to the frame.

The upper box in which the quill or slide works is made in two parts which can be adjusted or closed together in case of side wear and thus take up all lost motion on the sides.

We furnish with each Machine four chisels and four bits.

The Tight and Loose Pulleys are 12 inches in diameter and $3\frac{1}{2}$ inches face, and should make from 400 to 500 revolutions per minute.



No. 4. MORTISER AND BORER.

With Graduating Stroke. Weight, 2500 lbs.

No. 4. Mortiser and Borer.

With Graduating Stroke.

Our new No. 4 Graduating Stroke Mortiser and Borer is designed specially for rapid and accurate work in hard or soft wood. It possesses advantages that make it a very desirable machine for first-class Furniture Factories, Carriage, Wagon and Agricultural Implement Works, etc. It is so constructed that it will stand heavy work, and a boy can operate it with ease and dispatch, there being no jar whatever on the foot.

The column is cast hollow in one piece, with the Tight and Loose Pulleys running between two large journals. All the working parts are planed perfectly true, accurately fitted and gibbed, making it impossible to get out of line. We recommend it as a machine—on account of the special style of graduated stroke and the way it is fitted and planed—that will stand up to any kind of hard work for years without needing repairs.

The Chisel Mandrel is made of the best cast steel, connected to one solid ram, working in planed ways, making it impossible for the Mandrel to spring when mortising the hardest kind of wood at the full stroke.

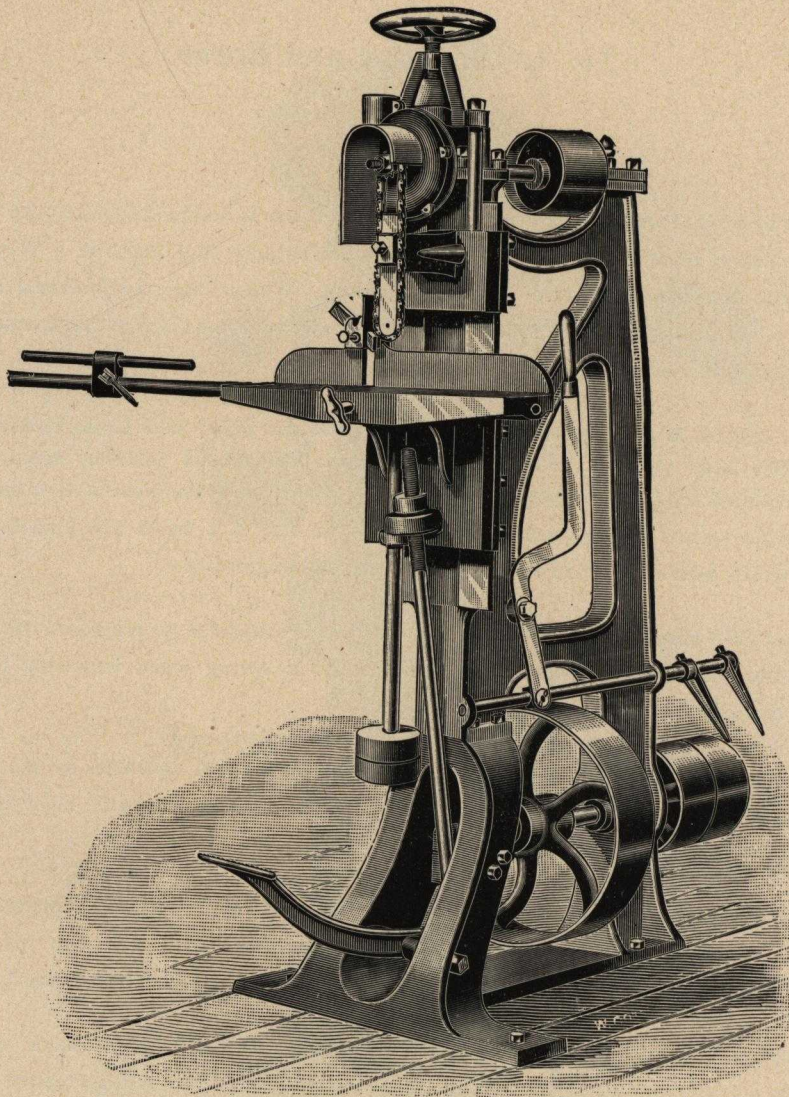
The patent radial Slide attached to the connections and operated by the treadle is entirely new, and prevents the slightest jar on the foot, and consequently adds to both the speed and comfort of the operator.

The patent Reverse, which is a very ingenious device, is perfectly automatic, and is controlled by the treadle and chisel Mandrel, reversing the chisel only when the treadle is released. This is the most perfect self-reverse ever put on this style of heavy mortiser.

The Bed is compound for mortising all kinds of angle and straight work, and has an adjustable nut and clamp screw for clamping wide or narrow stuff, and is supplied with hooks for holding the stuff to the bed. The upper part of the Bed works in planed ways, operated by a hand-wheel, rack and pinion. When mortising, the Bed is raised and lowered by a right and left-hand screw, to suit the thickness of stock and the depth of mortise wanted.

The Boring Mandrel is connected to the Machine, and furnished with a suitable lever and belt shifter to operate it. An adjustable gauge-stop is also supplied to gauge the depth of boring to suit the chisel. We furnish with each Machine six chisels— $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ and 1 inch, and six augers to match.

The Tight and Loose Pulleys are 12 inches in diameter and $3\frac{1}{2}$ " face and should make 350 revolutions per minute.



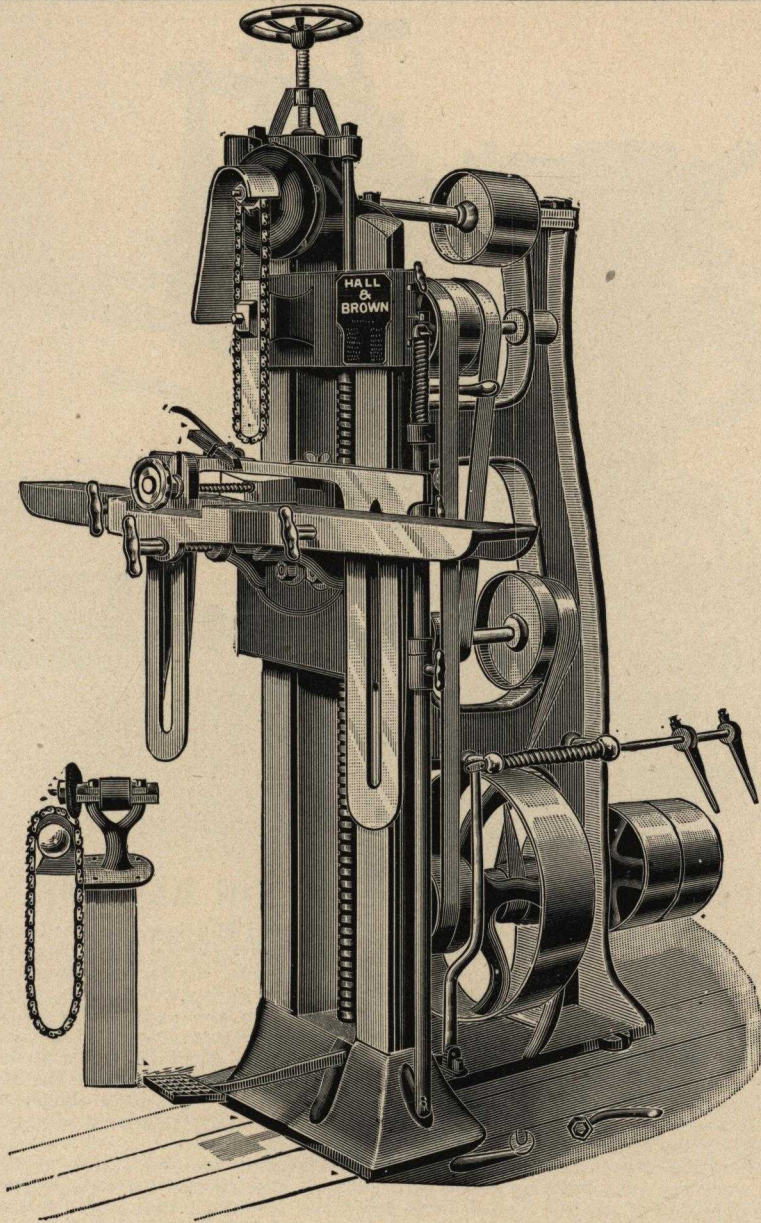
No. 1 CHAIN SAW MORTISER.

Weight, 800 lbs.

This machine is intended for sash and blinds, or light furniture; or, in other words, all classes of work where the mortise required does not exceed $\frac{3}{8}$ inch, and is especially adapted to meet the demand for a light, rapid-working machine, especially where it is necessary to put a mortise into thin, light stock without splitting the most delicate material.

Its capacity is from 8,000 to 10,000 mortises in ten hours, with an ordinary boy or man. The range of the machine is all sizes between $\frac{1}{4}$ and $\frac{3}{8}$ inch. The machine makes a clean cut mortise at one operation, no chips or shavings remaining in the mortise to be removed after the mortise has been made. We furnish two Chain Saws with each machine, also the Emery Grinder with two emery wheels, as shown in cut of our Standard machine, for sharpening the chain saws.

The Tight and Loose Pulleys are 8 inches in diameter and 4 inch face, and should make 750 revolutions per minute.



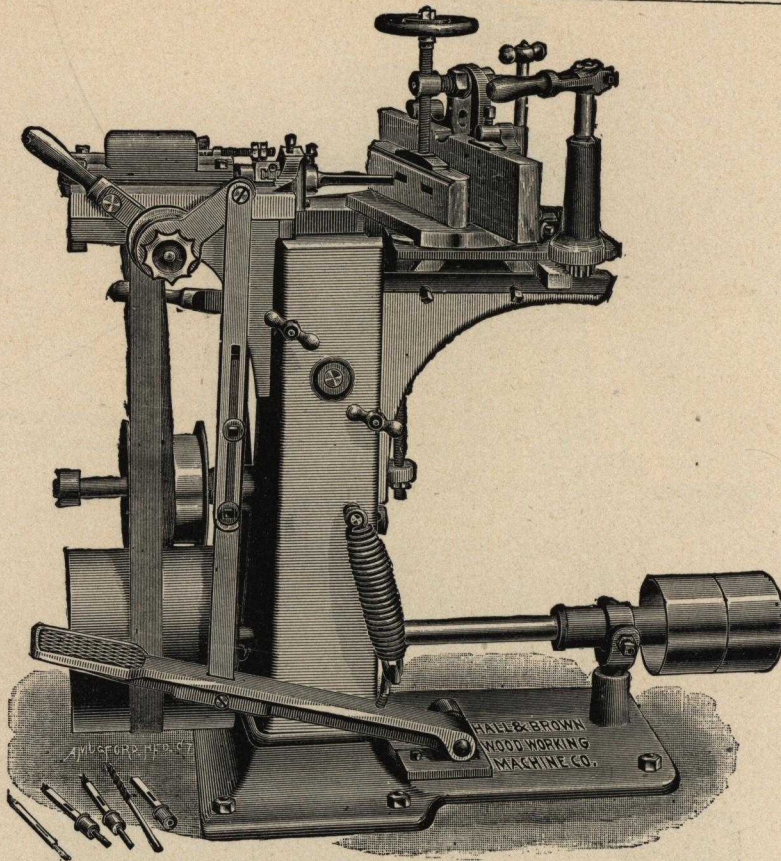
No. 2 STANDARD CHAIN SAW MORTISER.

Weight 1,100 lbs.

The above cut represents our Standard Chain Mortiser adapted to all classes of work where the mortise required does not exceed 1 inch. The machine works equally as well in hard as in soft wood. In mortising Yellow Pine, Fir and other pitchy woods, the gum has no effect on the tool, but clears its own way, leaving no core to drive and thus avoiding all possibility of splitting the stock.

No boring is required in mortising any material, whether hard or soft. The machine is adapted for all sizes of mortise from $\frac{1}{4}$ to 1 inch, and any length from $1\frac{1}{2}$ inches up, and will work to a depth of $6\frac{1}{2}$ inches without reversing the stock, and by reversing the stock a mortise can be cut 13 inches or less. We furnish two Chain Saws with each machine, and include the Emery Grinder shown in cut, with two Emery Wheels for sharpening the Chain Saws.

The Tight and Loose Pulleys are 9 inches in diameter and $4\frac{1}{4}$ inch face, and should make 900 revolutions per minute.



HOLLOW CHISEL MORTISING MACHINE.

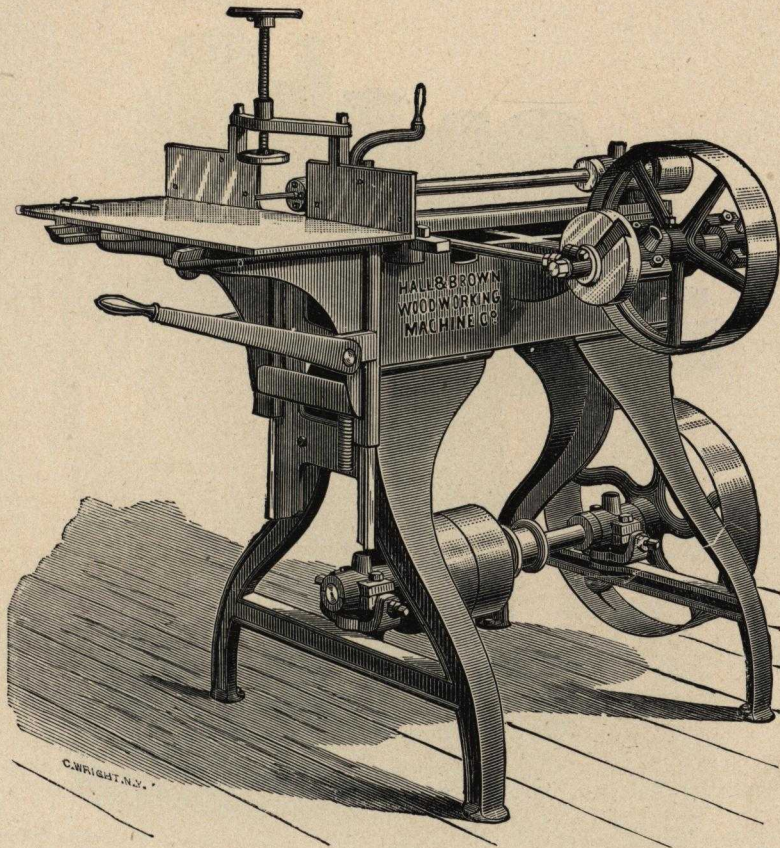
The above cut represents our Improved Hollow Chisel Mortiser, designed especially for Wagon and Carriage Builders' use, but it is equally adapted to other work, requiring a large number of mortises which must be perfectly interchangeable, laying out its own work and making mortises at the same time usually consumed in the laying out of the work for other machines. All of the adjustments linear, vertical or angular, are made by the operator without changing his position, which is a great saving in time taken in traveling around other machines, which take up a great deal of floor space. The base of this Machine is 10 x 30 inches, which is sufficiently large to insure stability, there being no shock or jar to strain the Machine.

The chuck which holds the bit is made of solid steel and will hold shanks from 0 to $\frac{1}{2}$ inch; the collet which holds chisel is vertically adjustable to compensate for wear of the spindle boxes caused by the down-ward pull of the belt.

The operation is as follows: The operator, standing at the front side of the Machine, secures the work upon the table by means of the clamp, and having the stops properly adjusted for angles and length of mortise, proceeds to force the chisel to the work by means of the treadle, and at the same time governing the cut with his left hand on the lever at the front side of the head; the depth is determined by a stop; after a forward stroke the work is moved sideways with the lever shown at the upper right hand side of the Machine, thus a mortise $\frac{1}{2} \times 1$ is made with a $\frac{1}{2}$ inch chisel at two strokes the chisel cutting a square hole at each operation. In making double mortises the head and table are adjusted vertically by the lever partly shown back of the belt; the head and table are so connected that as one raises the other falls, which counter-balances them, doing away with the balance weight usually employed in other machines, and at the same time providing for one-half of the take upon the belt. Secured to the back piece of the table is a hard-wood back board, which allows mortising entirely through the work, the chisel entering it, thereby preventing the slivering of the back side of the work. All of the adjustments are fastened by means of hand set screws, obviating the use of a wrench. With the Machine we furnish the belt as shown, also four chisels of any size designated by the purchaser up to $\frac{3}{4}$ inch. Purchasers should specify whether chisels are to be used on hard or soft wood. The Tight and Loose Pulleys on counter-shaft are $6\frac{1}{2}$ inches in diameter for a five-inch face and should make 1000 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt 5 inches wide, in length to suit from line shaft.
Spindle Belt furnished with the Machine.



COMBINED BORING AND BIT MORTISER.

Weight, 650 lbs.

This is a finely designed, substantial, well made tool, adapted to the wants of any shop where boring and mortising are required.

The main spindle is of steel and is supplied with a self-centering chuck, having hardened steel jaws, with capacity for any bit shank up to $\frac{3}{4}$ inch in diameter. The table has a horizontal movement on ways of 6 inches, and a vertical adjustment of 9 inches by a hand crank and screw, all the ways being provided with nicely fitted take-up gibs. There is also a stop gauge under the table to limit the depth of the cutting.

For mortising, the hand-lever under the table is used, but for boring, it may be detached, if preferred, by removing a joint screw. The clamp shown in the cut is used for square work, and the table is of iron but this may be varied to order, for different classes of work.

The crank-shaft is solidly boxed on arms projecting from the bed of the machine, the latter being cast in one piece, so that none of the parts can get out of line. The center of vibration of the main spindle is directly under the center of the pulley. The crank-pin is easy of access for adjustment, and is held absolutely rigid when set.

For chair and other light work that has to be handled fast, I provide, in place of the above screw and table, a quick-acting, eccentric clamp, which is adjustable for different kinds of work, and clamps the stock instantaneously at either one or two points as desired; this is usually attached to a hard wood table glued up in strips. The base of the machine is very broad and cannot tremble on a reasonable good floor. All revolving parts are carefully balanced.

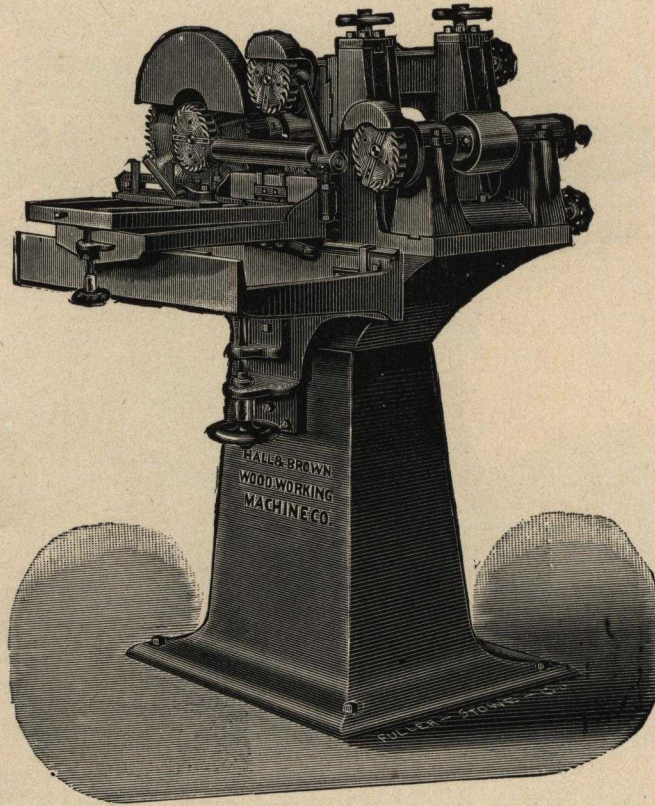
Tight and Loose Pulleys are 8 inches diameter, $4\frac{1}{4}$ inch face and should make 1000 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 4 inches wide, in length to suit from line shaft.

One Spindle Belt, 7' 5" long, 3" wide.

One Crank Shaft Belt, 6' 8" long, 2 $\frac{3}{4}$ " wide.



CHAIR BACK TENONER.

Weight, 1000 lbs.

Our Chair Back Tenon Machine is of new design, made on column. The carriage ways are adjustable, and gibbed on the main column.

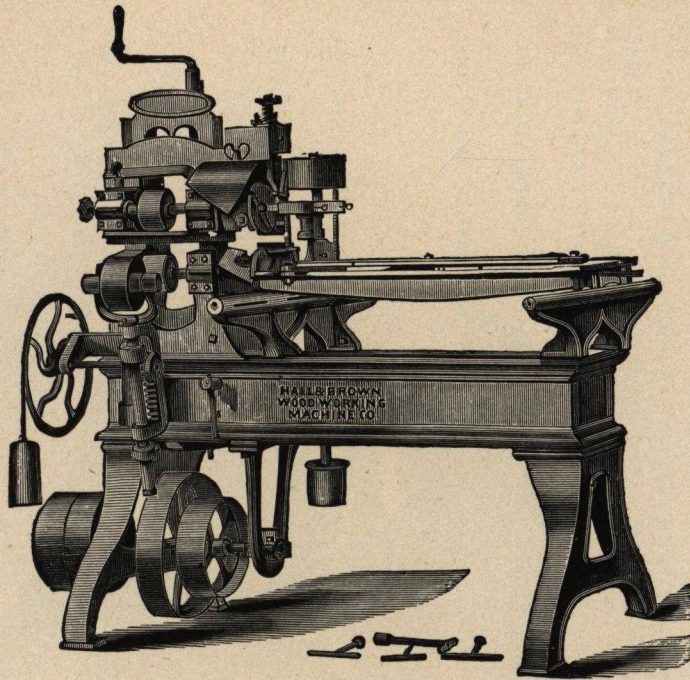
The carriage itself is very light, and also gibbed down, and made adjustable for both straight and circling backs.

The cutters are made of solid steel, and each cutter arbor is adjustable independently, so that the shoulders on the work can always be cut perfectly.

The Machine will cut 2500 slats per day.

Each Machine is furnished with counter shaft.

Tight and Loose Pulleys are 10 inches in diameter and 5 inch face, and should make 800 revolutions per minute.



No. 1. IMPROVED SASH AND BLIND TENONER.

Weight, 750 lbs.

The engraving appended represents our Improved No. 1 Tenoning Machine, which has a very substantial iron frame, and is finished in the best manner. It is used principally for sash and blinds.

The cutter-heads are made small, so that they can be run at great speed; and, by running much faster than heads on other machines, they do better work and more of it.

The top headstock is adjustable up and down and in and out, and both headstocks can be moved up and down together without changing the thickness of the tenon in the least; this will be found difficult to do on any other machine after it has become worn.

The bottom headstock and the main standard are in one piece, and are gibbed to the inside of the frame, and raised and lowered by a screw.

The binding arrangement is complete. It is operated by a weight, and is self-adjusting, either vertically or horizontally.

The table is sufficiently heavy to always remain in position, but slides very easily.

The machine has an adjustable gib bolted on the end of the table, which operates against the side of the slide. It can be tightened as the slide wears away, or loosened, so that the table will slide more freely; this will be found a very useful arrangement after the slide has become worn.

There is also an improved hold-down on this machine, which will be found very convenient; the lumber operated on being held down by a ratchet, which operates instantly, holding the shortest pieces firmly in place.

The cut-off attachment is adjustable to any length tenon desired (by means of a screw) without stopping, and is run with the same belt as the heads.

All operators who have these machines recommend them, and say that they are the best now in use. We guarantee them to give satisfaction in every case.

The Tight and Loose Pulleys are 10 inches in diameter and 3 inch face and should make 900 revolutions per minute.

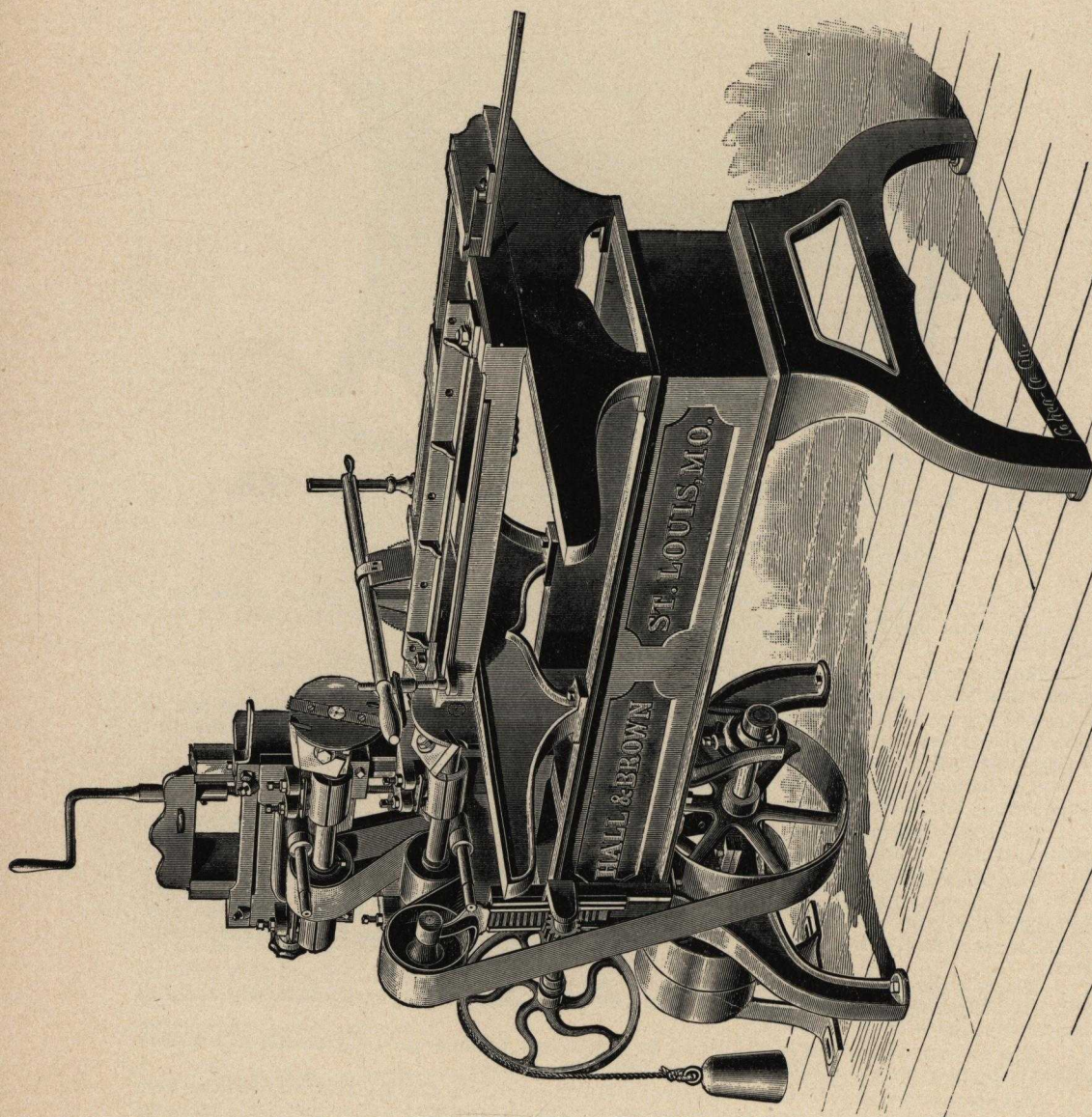
BELTS WHEN ORDERED.

Driving Belt, 3 inches wide, in length to suit from line shaft.

One Cutter-Head Belt, 9' 7" long, 3" wide. Two Cope Head Belts, 3' 6½" long, 2" wide.

One Cope Shaft Belt, 7' 4" long, 3" wide.

If cut-off saw is ordered the cutter head belt should be 10 feet, 2 inches long.



No. 2. IMPROVED CABINET TENONER.
Weight, 950 lbs.

No. 2. Improved Cabinet Tenoner.

This Machine is designed expressly for Furniture, Agricultural Works and other purposes where the Coping Attachment is not required. A cross-cut Saw is attached to the rear of this Machine and driven from the counter-shaft below to trim of the tenon the desired length at the same operation in passing the lumber through the Heads. We can furnish this Machine without the cut-off attachment if desired.

It is built entirely of iron and steel, strong and substantial, yet not cumbersome in working but is easily handled and for convenience of Adjustment is unsurpassed.

The Steel Spindles which carry the Heads work in long babbitted boxes. The upper and lower heads are operated by a single screw and crank handle, and can be raised and lowered simultaneously or independently. By placing the crank on the pinion shafts projecting through the headstocks in front, either head can be raised or lowered separately, then by simply changing the crank to the screw, as shown in the cut, both heads can be raised or lowered without changing the thickness of the tenon in the least.

The upper head, shaft and boxes have a lateral movement over the lower head, so as to cut one tenon of the shoulder longer than the other if desired.

Each Cutter Head shaft has an effective arrangement which prevents all vibrations endwise.

The cutter heads are single, to cut $3\frac{1}{4}$ inches in length, or double to cut $6\frac{1}{2}$ inches in length as ordered.

The Knives are formed to have a drawing cut, whereby they cut easily and smoothly. Saws are used in the heads instead of spurs. The Driving Pulleys are wide and placed between the boxes, and the belt runs with perfect clearance.

The tightening arrangement is complete. It is operated by a weight and Pulley, and when the belt is once laced it needs no further attention.

The table is light and strong and slides easily. It has the necessary stops for getting the exact length of tenon to be cut. The table is clamped to the front side so that by no possible means can it be thrown into the Heads, as is the case with some other Machines. Neither can it be accidentally thrown to the floor. The front slide is grooved instead of the table, consequently not so liable to work dry.

The Machine is adapted to all classes of work where a medium size Machine is needed, such as Cabinet and Agricultural work, etc.

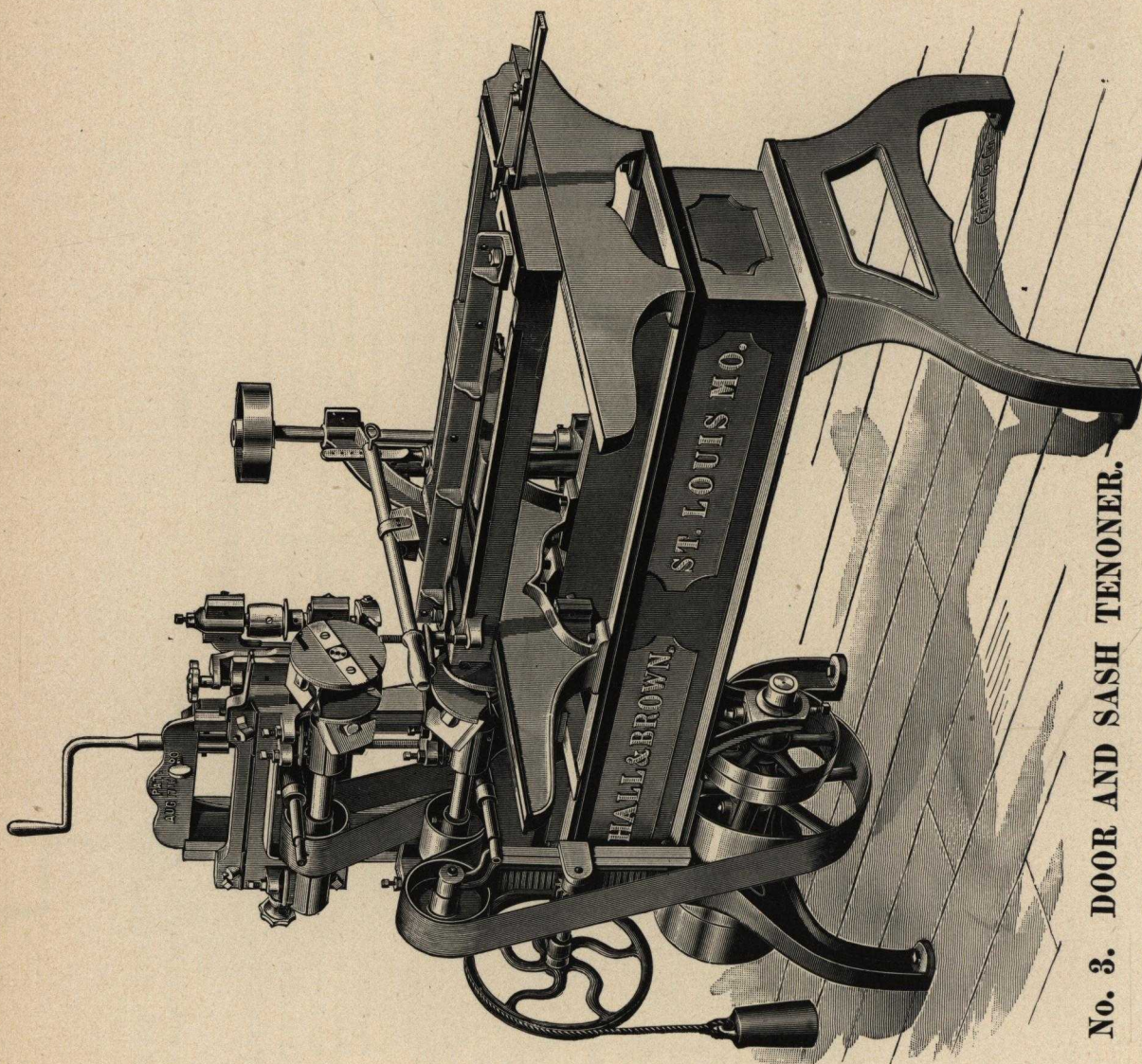
The Tight and Loose Pulleys are 10 inches in diameter and $4\frac{1}{2}$ inch face and should make 800 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 4 inches wide, in length to suit from line shaft.

One Belt for Cutter Heads, 10 feet 2 inches long, 4 inches wide.

One Belt for Cut-off Saw, 6 feet long, $1\frac{1}{2}$ inches wide.



No. 3. DOOR AND SASH TENONER.

Weight, 1100 lbs.

No. 3. Door and Sash Tenoner.

The machine here illustrated is from new designs and with several very important improvements. It is intended for the heaviest door or other work, cutting a tenon $6\frac{1}{2}$ inches long at one cut. It is built entirely of iron and steel, very strong and substantial, yet not cumbersome in working, but easily handled, and for convenience of adjustment is unsurpassed.

The steel Spindles which carry the heads work in long babbitted boxes. The upper and lower heads are operated by a single screw and crank handle, and can be raised and lowered simultaneously or independently. By placing the crank on the pinion shafts projecting through the head stocks in front, either head can be raised or lowered separately; then, by simply changing the crank to the screw, as shown in the cut, both heads can be raised or lowered without changing the thickness of the tenon in the least.

The Upper Head, Shaft and Boxes have a lateral movement over the lower Head, so as to cut one shoulder of the tenon longer than the other if desired.

Each Cutter Head Shaft has an effective arrangement which prevents all vibrations endwise.

The Cutter Heads are single, to cut $3\frac{1}{2}$ inches in length or double to cut $6\frac{1}{2}$ inches in length, as ordered.

The Knives are formed to have a drawing cut, whereby they cut easily and smoothly. Saws are used in the heads, instead of spurs. The Driving Pulleys are wide and are placed between the boxes, and the belts run with perfect clearance.

The tightening arrangement is complete. It is operated by a weight and pulley, and when the belt is once laced it needs no further attention.

Each cope is attached to the head stock in which the cutter-shaft revolves, and needs no separate setting, while they are arranged so they can be adjusted separately if desired.

The Cope-heads are fastened to the shaft with a set screw, the shaft being spotted to receive the point of the screw so that the heads can be changed instead of changing cutters, which will be found very convenient and save time in changing from one class of work to another. We send three Cope-heads with each Double Cope Machine.

The table is light and strong and slides easily. It has the necessary stops for getting the exact length of tenon to be cut. The table is clamped to the front slide so that by no possible means can it be thrown into the Heads, as is the case with some other machines. Neither can it accidentally be thrown to the floor. The front slide is grooved instead of the table, consequently not so liable to work dry.

The machine is adapted to all classes of work where a Medium Size Machine is needed, such as Sash, Doors, Cabinet and Agricultural work, etc. The machine, as shown here, is arranged with Double Copes for Doors.

We guarantee this machine to give entire satisfaction in every case.

Tight and Loose Pulleys are 10 inches in diameter and $4\frac{1}{2}$ inch face and should make 800 revolutions per minute.

BELTS WHEN ORDERED.

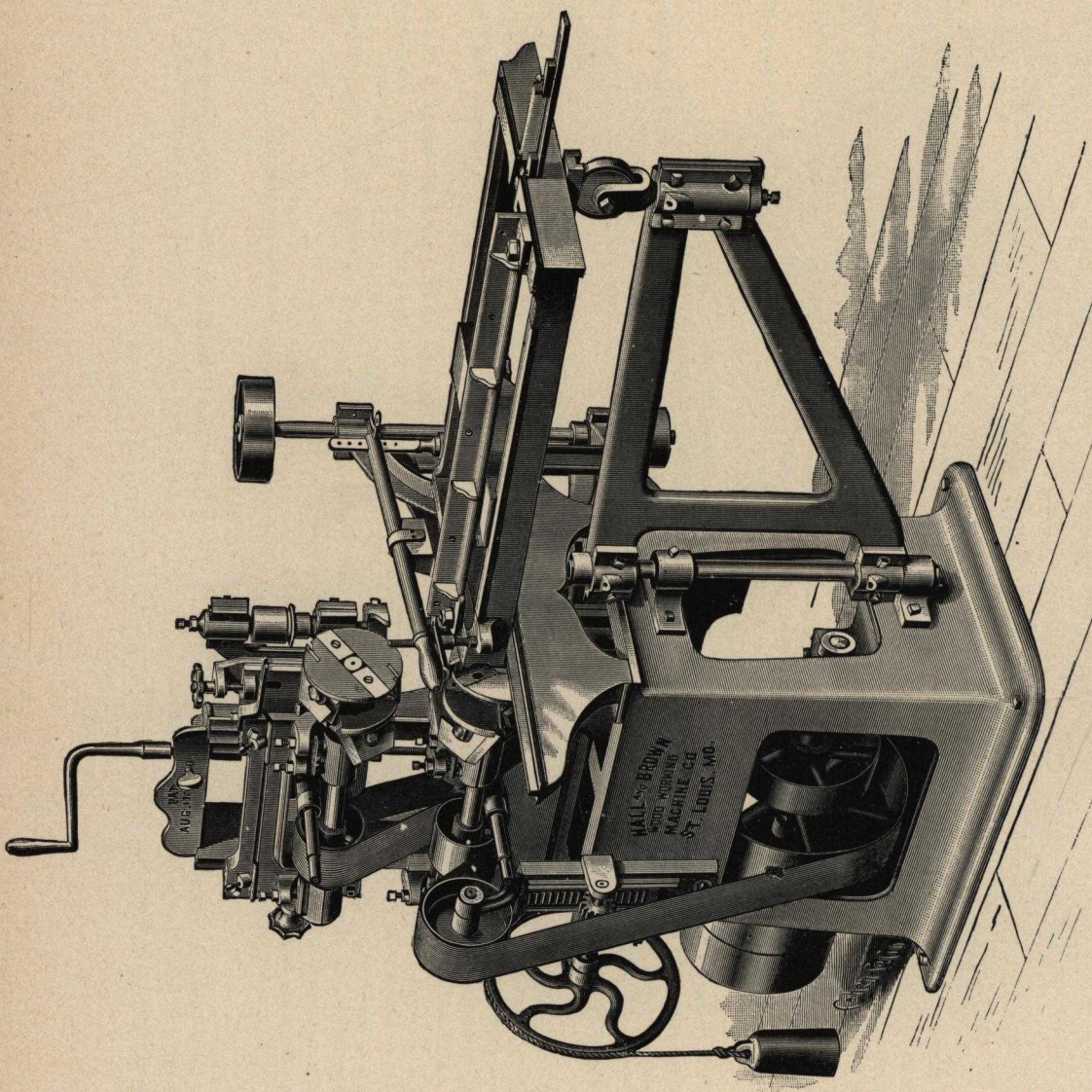
Driving Belt, $4\frac{1}{2}$ inches wide, in length to suit from line shaft.

Two Cope Head Belts, 7 feet 9 inches long each, $1\frac{1}{2}$ inches wide.

One Cutter Head Belt, 10 feet 2 inches long, 4 inches wide.

Cut-off Saw Belt, 6 feet long, $1\frac{1}{2}$ inches wide.

One Cope Shaft Belt, 8 feet 2 inches long, $2\frac{1}{2}$ inches wide.



No. 4. DOOR AND SASH TENONER.
With Vibrating Carriage. Weight, 1220 lbs.

No. 4. Door and Sash Tenoner.

With Vibrating Carriage.

This Machine as illustrated on opposite page is intended for doors, sash or other work, cutting a tenon $6\frac{1}{2}$ inches or less, and with double copes. We, however, build this same Machine as a Cabinet Tenoner for Furniture or other work where the copes are not required, and with Single Heads to cut a tenon $3\frac{1}{2}$ inches long. We can also attach a cross-cut saw when wanted to trim the tenon the desired length which is driven from the same counter shaft as the Heads.

The entire working parts are mounted on a heavy column which has a large floor support. The counter shaft passing through this column. The cutter headshafts being belted in the center between the Journal Boxes.

The principal feature of this Machine is its vibrating carriage which is gibbed to and runs on a single slide with a connection extending down and uniting at the base to a swinging arm, thereby releasing the carriage of friction and making the movement of the carriage light. The carriage is supplied with all the necessary stops for getting the exact length of tenon to be cut.

The steel spindles which carry the heads work in long babbitted boxes. The upper and lower heads are operated by a single screw and crank handle, and can be raised or lowered simultaneously or independently. By placing the crank on the pinion shafts projecting through the head stocks in front, either head can be raised or lowered separately, then by simply changing the crank to the screw, as shown in the cut, both heads can be raised or lowered without changing the thickness of the tenon in the least.

The upper head, shaft and boxes have a lateral movement over the lower head, so as to cut one shoulder of the tenon longer than the other if desired.

Each Cutter-Head Shaft has an effective arrangement which prevents all vibrations endwise.

The Knives are formed to have a drawing cut, whereby they cut easily and smoothly. Saws are used in the Heads instead of spurs. The driving Pulleys are wide and are placed between the boxes, and the belt runs with perfect clearance.

The tightening arrangement is complete. It is operated by a weight and Pulley and when the belt is once laced it needs no further attention.

Each cope is attached to the head stock in which the cutter shaft revolves, and needs no separate setting, while they are arranged so that they can be adjusted separately if desired.

The cope heads are fastened to the shaft with a set screw, the shaft being spotted to receive the point of the screw so that the heads can be changed instead of changing cutters, which will be found very convenient and save time in changing from one class of work to another. We send three cope heads with each Double Cope Machine.

The Machine is adapted to all classes of work where a medium size Machine is needed such as Sash, Doors, Cabinet and Agricultural Work, &c. The Machine as shown here is arranged with double copes for doors.

The Tight and Loose Pulleys are 10 inches in diameter and $4\frac{1}{2}$ inch face and should make 800 revolutions per minute.

BELTS WHEN ORDERED.

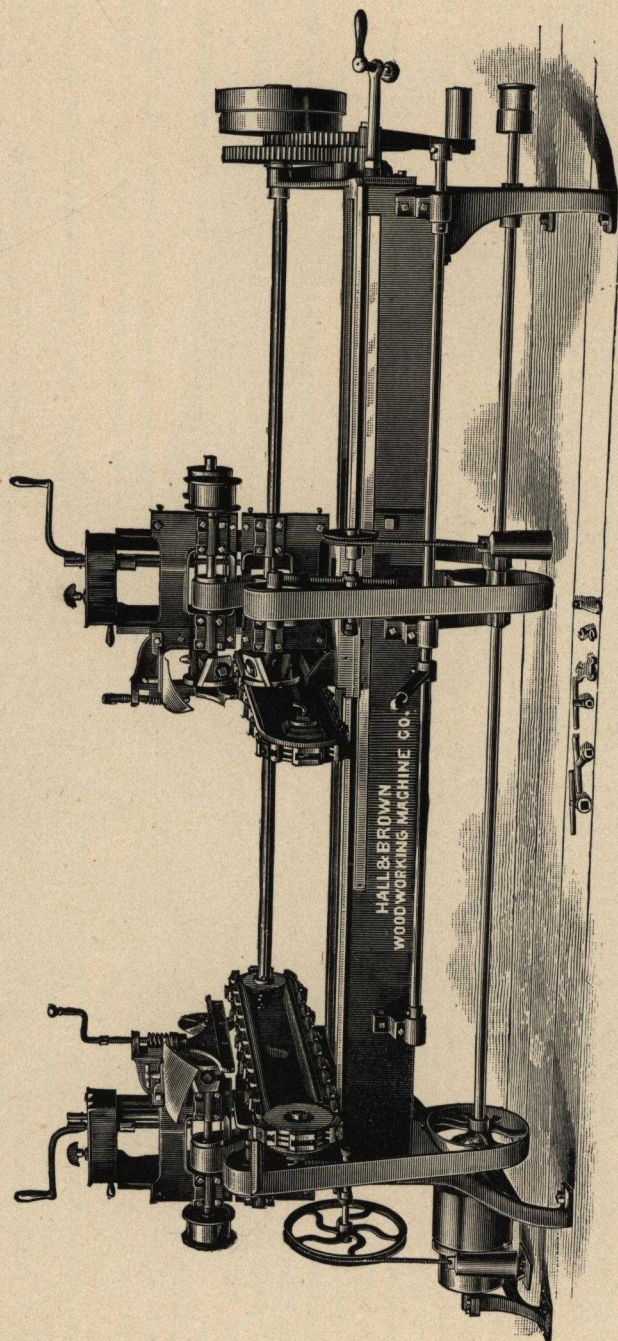
Driving Belt, $4\frac{1}{2}$ inches wide, in length to suit from line shaft.

One Cutter Head Belt, 10 feet 2 inches long, 4 inches wide.

One Cope Shaft Belt, 8 feet 3 inches long, $2\frac{1}{4}$ inches wide.

Two Cope Head Belts each, 7 feet 9 inches long, $1\frac{1}{2}$ inches wide.

One Cut-off Saw Belt, 6 feet long, $1\frac{1}{4}$ inches wide.



No. 5. IMPROVED DOUBLE END TENONER.

Weight with Double Copes, 2400 lbs.

No. 5. Improved Double End Tenoner.

The Machine illustrated on opposite page is intended for cutting the tenon at each end of the material at one and the same operation and is suitable for all classes of work within its range. The tenons to be cut not to exceed 4 inches in length, and the material to be worked to be from 6 inches to 6 feet in length between the shoulders of the tenon.

Single or Double Copes, or cut-off saws on one or both ends are provided as specified in order; Cutters and saws are furnished suitable for the work required.

The adjustable end of the Machine carries its driving Pulley with it when regulating the Machine for different lengths of work, the adjustment being simple and effective. The Machine requiring no more skill to operate than an ordinary Tenoner.

The chain bed or feeding carriage is automatic and continuous being operated from a shaft above the movable end of the Machine. This chain carriage is made accurate, every link being connected and provision made for the wear.

An index is placed upon the front of the Machine to indicate the length of the material to be cut between the shoulders. The movable end of the Machine carrying the driving Pulley below is adjusted to any desired length by the crank shown in cut.

Tight and Loose Pulleys are 10 inches in diameter and 6 inch face and should make 900 revolutions per minute.

BELTING FOR DOUBLE COPE MACHINE WHEN ORDERED.

Driving Belt, 5½ inches wide, in length to suit from line shaft.

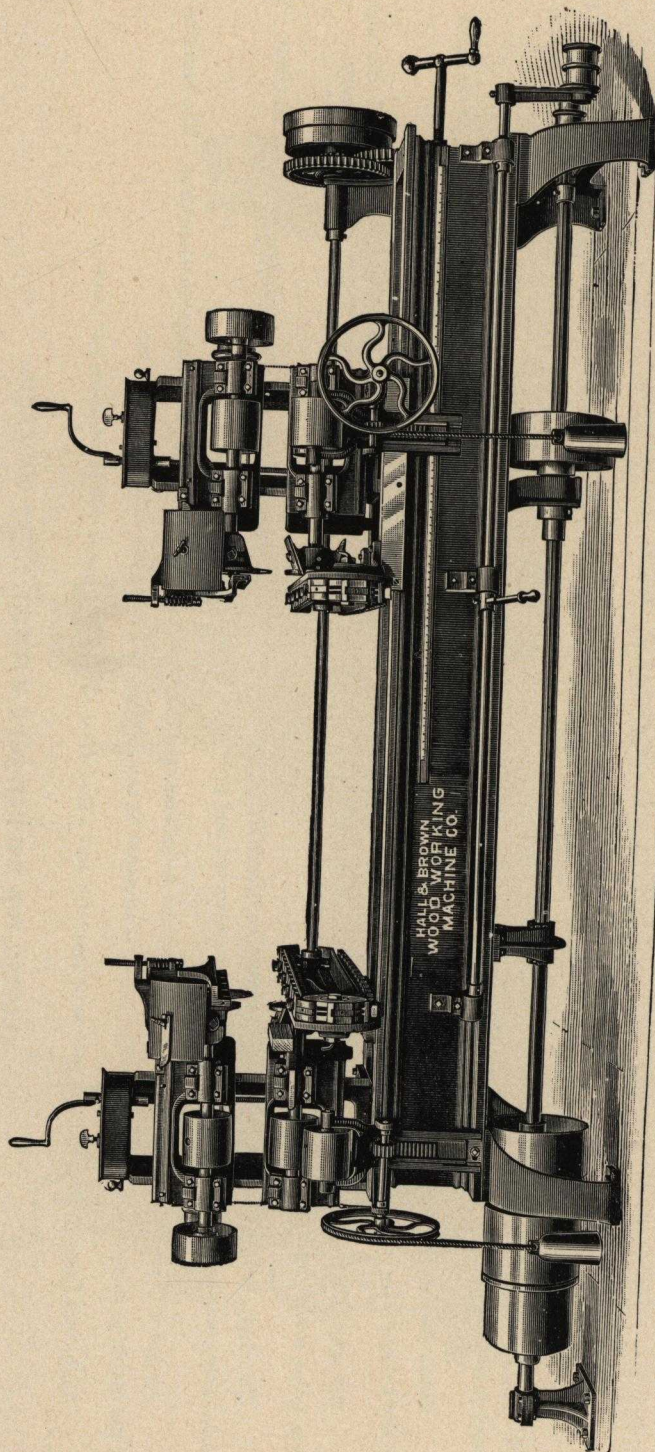
Two Cutter Head Belts, 9 feet long each, 3 inches wide.

Two Cope Driving Belts, 8 feet long each, 2½ inches wide.

Four Cope Head Belts, 7 feet long each, 2½ inches wide.

One Feed Belt, 7 feet 6 inches long, 2 inches wide.

Two Saw Belts, 6 feet long each, 2½ inches wide.



No. 6. IMPROVED DOUBLE END TENONER.

Weight with Double Copes, 4500 lbs.

No. 6. Improved Double End Tenoner.

This Machine is similar in construction to the No. 4, illustrated and described on the two preceding pages. The frame and all other parts of the Machine being increased in weight and strength to withstand the heavy work for which it was intended.

It is especially designed for heavy work such as agricultural, car work or Planing Mills.

The Machine will work 16 inches in width or less and from 8 inches to 64 feet in length between the shoulders of the tenon. When Double Heads are used it will make the tenon 7½ inches in length or less, and of any required thickness. The engraving represents a Single Head Machine with cut-off saws, but it is made with single or double copes, Single or Double Heads, with or without saws as ordered.

It is provided with a graduation index in front of the Machine to indicate the length between the shoulders of the tenon and the movable end of the Machine is operated by the crank shown in cut to get the desired length between the shoulders of the tenon.

The feed is automatic and continuous, being operated by a shaft above the movable end of the Machine.

The rate of feed is about 12 feet per minute, and may be started or stopped instantly by a lever within easy reach of the operator.

An adjustable fence is provided in front, and on the left against which to start the lumber so that pieces very close to length can be worked and by this means the operator is enabled to keep the Machine full.

The Pressure Bars over the feed are adjustable, independent of the head-stock and are yielding to support narrow stuff which might vary slightly in thickness, thereby holding the work firmly down and against the angle plates insuring square work.

Tight and Loose Pulleys are 12 inches in diameter and 8 inches face, and should make 800 revolutions per minute.

BELTING FOR DOUBLE COPE MACHINE WITH DOUBLE SAW WHEN ORDERED.

Driving Belt, 7½ inches wide, in length to suit from line shaft.

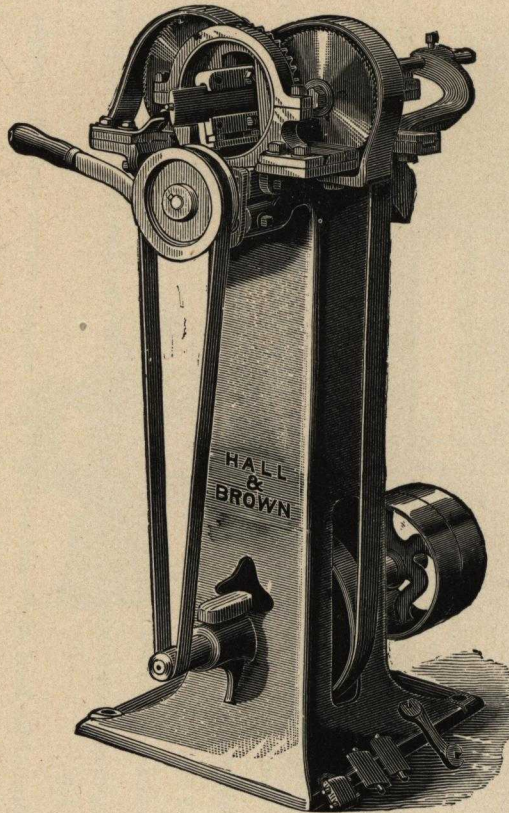
Two Cutter Head Belts, 11 feet 3 inches long each, 5 inches wide.

Two Cope Driving Belts, 8 feet 2 inches long each, 3 inches wide.

Four Cope Head Belts, 6 feet, 9 inches long each, 2½ inches wide.

Two Cut-off Saw Belts, 8 feet, 2 inches long each, 2½ inches wide.

One Feed Belt, 8 feet 1 inch long, 2½ inches wide.



SELF FEED BLIND SLAT TENONER.

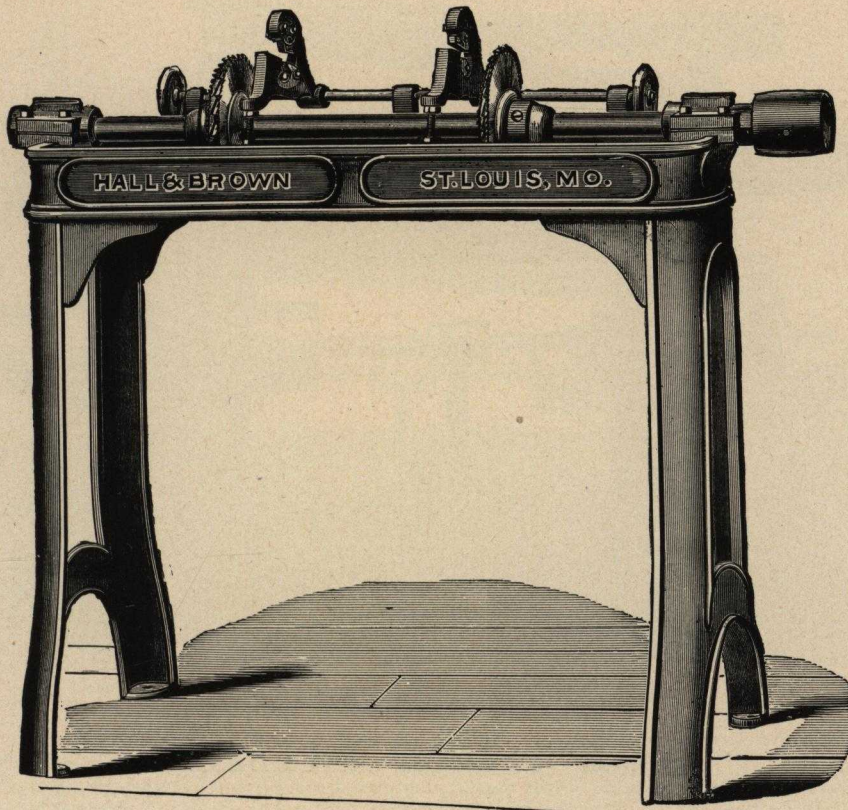
Weight, 270 lbs.

This cut represents our new and improved Self-feed Blind Slat Tenon Machine, which in construction is altogether different from any machine of the kind ever placed on the market, and we claim that double the number of slats can be tenoned upon it that can be done upon any other Self-feed Tenoner. The Lever which operates the Feed Works is convenient to the operator, and raising it brings the head holding the slat against the saws, which make the tenon. At this point it is released from the stop, and the head is allowed to revolve, making one revolution, and again coming in contact with the stop, when it is ready to make another tenon. We claim a grand advantage over all other Tenon Machines in making short slats, as we have only one set of Slat Holders to adjust and keep in line, and we can readily tenon slats as short as $\frac{1}{2}$ inch in length. The adjustments for changing from wide to narrow slats are very simple and handy. No manufacturer of blinds can afford to be without one of these machines in his factory.

The Tight and Loose pulleys are 8 inches diameter by $2\frac{1}{2}$ inch face, and should make 900 revolutions per minute.

Driving Belt, $2\frac{1}{4}$ inches wide, in length to suit from line shaft.

Cutter Head Belt furnished with Machine.



BLIND SLAT TENONER.

Weight with Counter, 200 lbs.

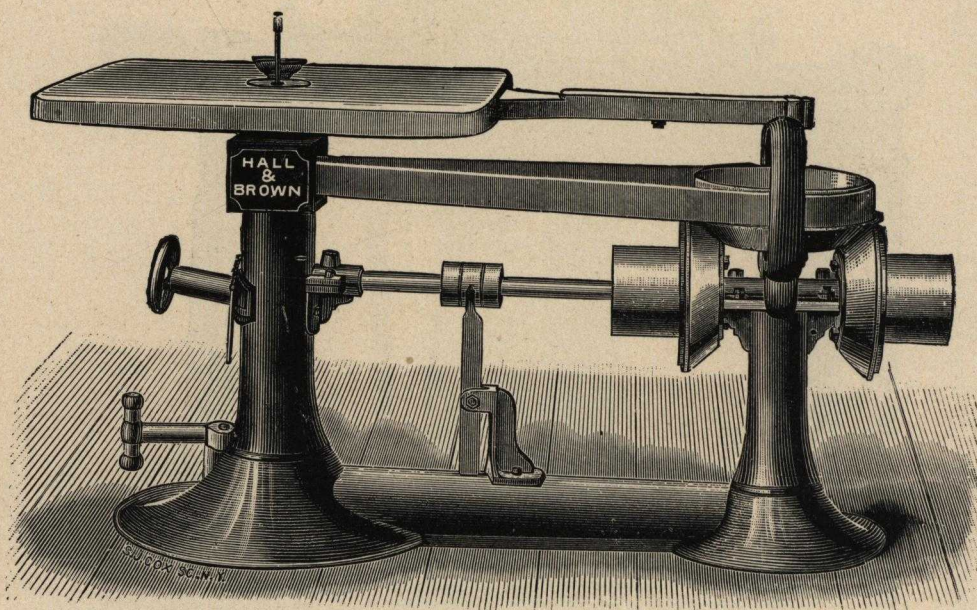
Weight without Counter, 150 lbs.

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This cut represents the latest Improved Blind Slat Tenoner, and upon examination it will be found to be strong, simple and durable. On this machine we do away with small and weak parts, thus increasing its strength and durability. The number of places requiring oiling are reduced. The belt is outside of the frame, consequently pieces cannot get between it and the pulley. The saws are larger than are used on any other machine. The capacity of this machine is slats for two hundred pairs of blinds per day. All the saws slide and run on one shaft, are thus always at a true right angle to the slat and therefore cannot saw the shoulders of the slats out of square or damage them. Changing from one length of slat to another requires but a few seconds. Every machine guaranteed to give full satisfaction. Counter-shaft attached to machine when so ordered.

Tight and Loose Pulleys on counter shaft, 6-in. diam. x 3-in. face, and should make 840 revolutions per minute.

Driving Belt, 3 inches wide, length to suit from line shaft or counter.



No. 4. VARIETY MOULDER.

Weight, 950 lbs.

This Machine is intended for Furniture Factories, Planing Mills and all ordinary varieties of work and is complete in itself and ready for use. No separate counter-shaft, but all neatly built upon one base, combining great strength and durability.

The Mechanism for raising and lowering the Spindle is within the upright that supports the table, and is operated by the hand-wheel.

The T on the base of the machine connects with an eccentric joint arranged between springs below the base plate, and works the shifting lever.

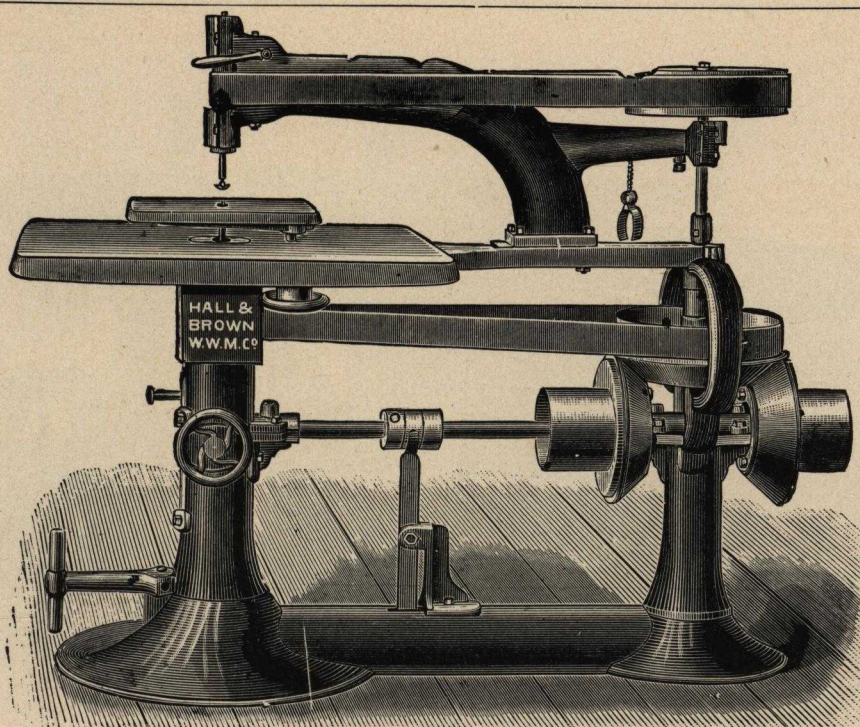
The T will stand at any angle, and is set to the right or left with the foot, and the operator's hands are free to move his work to the Cutter, which is instantaneous in its action, and is under such command that it can be brought to a full speed or a standstill, in a second of time.

The Friction and Belt Pulleys are, in a manner, one, and therefore as light as is possible to make them.

The Counter-Shaft Bearings are placed immediately below the point of friction contact to secure the power at once direct and strong. The operator has full and perfect command of the machine without moving out of position.

To change Spindles, throw off the belt and run the housing, by means of the hand-wheel, to the top of table, when one part is readily changed for another part—having the size Spindle wanted.

Driving Pulleys 7 inches in diameter, $5\frac{1}{2}$ inch face and should make 800 revolutions per minute.



No. 6. VARIETY MOULDER.

Weight, 1050 lbs.

This Machine is intended for a larger variety of work than the No. 1, including surface moulding, sunken panels for solid drawer fronts, corner block, irregular tracings, rosettes, &c. When used for edge moulding the over-hanging arm can be thrown up out of the way without removing same from the Machine.

The Machine is complete in itself and ready for use.

No separate counter-shaft, but all neatly built upon one base, combining great strength and durability.

The Mechanism for raising and lowering the Spindle is within the upright that supports the table, and is operated by the hand-wheel.

The T on the base of the machine connects with an eccentric joint arranged between springs below the base plate, and works the shifting lever.

The T will stand at any angle, and is set to the right or left with the foot, and the operator's hands are free to move his work to the Cutter, which is instantaneous in its action, and is under such command that it can be brought to full speed or a standstill in a second of time.

The Friction and Belt Pulleys are, in a manner, one, and therefore as light as is possible to make them.

The Counter-Shaft Bearings are placed immediately below the point of frictional contact to secure the power at once direct and strong. The operator has full and perfect demand of the machine, without moving out of position.

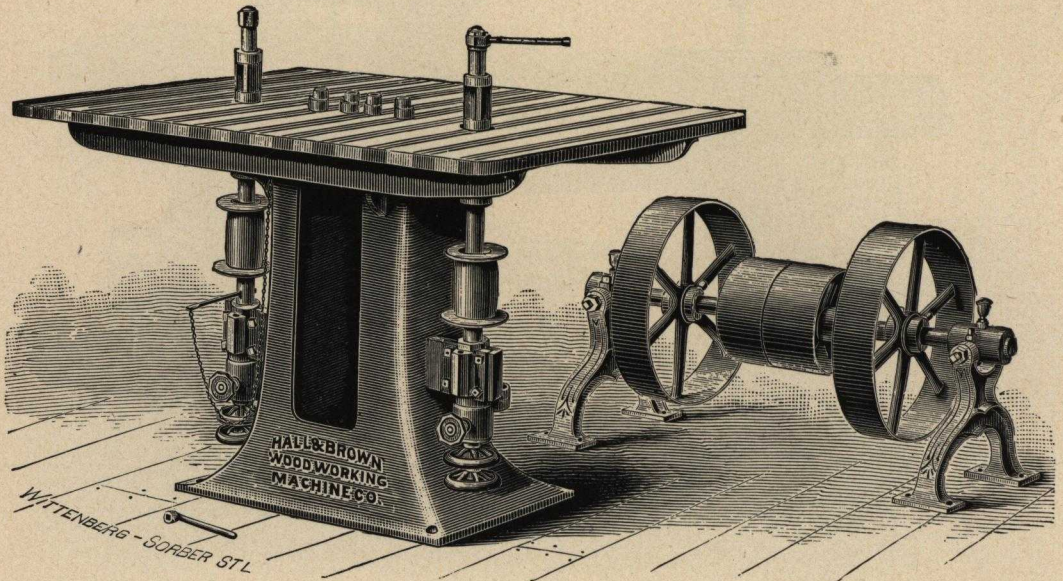
To change Spindles, throw off the belt and run the housing, by means of the hand-wheel, to the top of table, when one part is readily changed for another part—having the size Spindle wanted.

This Machine cuts Solid Panels to pattern guided by collar that automatically takes its position when you start the Machine and drops out of the way when you stop it. The Cutter in the overhanging arm of the machine has a perpendicular adjustment of one inch, and is operated by the handle, shown in the cut, attached to an eccentric lever that is automatically locked to the one position when at work.

The work is done on the small table, which is adjustable by means of a hand-wheel, to suit the cut. The cut can be made either from the top or from the bottom. The Cutter can be placed in either the upper or the lower Spindle.

This attachment is designed for sinking Panels, Surface and Irregular Mouldings and Carving, etc. When the machine is needed for Edge Moulding, the attachment is thrown out of the way.

The Driving Pulley is 7 inches in diameter and 5½ inch face and should make 800 revolutions per minute.



No. 1. EDGE MOULDING OR SHAPING MACHINE.

Weight, 900 lbs.

The demand for a cheap machine where a limited amount of work is required, induced us to bring out this machine.

The frame is one solid cast column, the spindle boxes cast on, the spindles are made of the best steel, of large size, running in best Babbitt boxes. The cutter spindles are same size and length as in shaper No. 2, on opposite page, namely, $1\frac{1}{8}$ inch, size where heads go on $\frac{3}{8}$ inch diameter.

The top is 4 feet 6 inches by 3 feet 4 inches, made of alternate strips of hard wood glued together to prevent warping or shrinkage, with 27 inches between spindles.

The Spindles have a vertical adjustment by means of a hand wheel at the bottom.

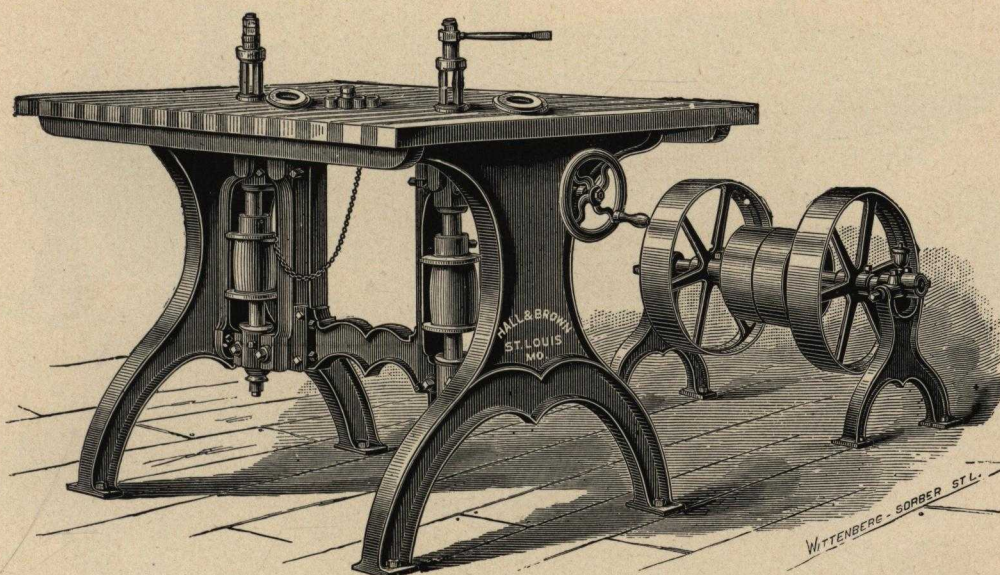
The Counter-shaft is the same as used with No. 2 Machine, 1 11-16 inches diameter and bab-bitted in a good substantial floor hanger, as in No. 2. We send two sets of steel heads and one set of 3 inch plain knives with each machine.

The Counter-shaft has Tight and Loose Pulleys. 10 inch diameter, $5\frac{1}{2}$ -inch face, and should make 850 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt 5 inches wide, in length to suit from line shaft.

Two Upright Spindle Belts not less than 17 feet each, $3\frac{1}{2}$ inches wide.



No. 2. EDGE MOULDING OR SHAPING MACHINE.

Weight, 900 lbs.

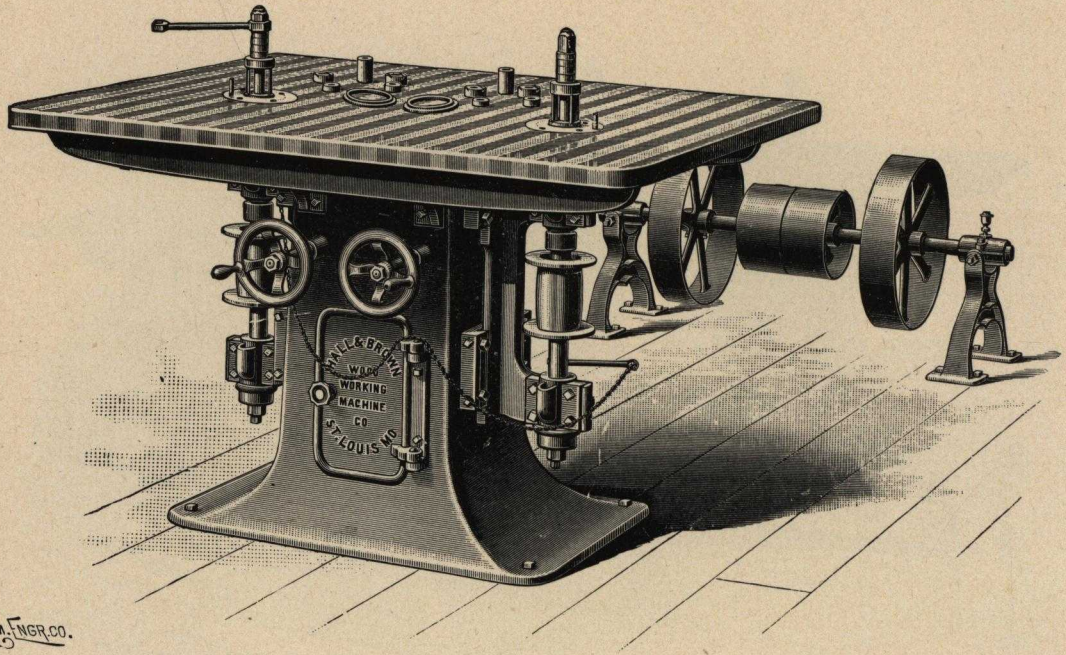
This Machine has been made from new designs and new patterns, embodying recent important improvements which greatly increase its efficiency and value, and is suited to perform the heaviest kinds of work as well as light. It has a heavy iron frame, with wood top, made of alternate strips of hard wood glued to prevent warping or shrinkage. The top is 4 ft. 6 in. by 3 ft. 4 in., $1\frac{3}{4}$ thick, the spindles are 27 in. apart. It has iron rings let into the table where the spindles come up through, and duplicate ring to fit, to close the space for small heads. The vertical spindles are large in diameter and run in headstocks, having connected bearings, upper and lower, cast solid so as to be retained always in line. These headstocks have a vertical adjustment up or down by turning the hand wheels at the side of the table.

The steps or lower box are conical shape, lined with gun metal, with an oil chamber in which the end of the shaft runs on a steel plug and adjusted separately on the headstock to take up all lost motion. The heads are made of steel and independent of the shafts, and can be used from $1\frac{3}{8}$ to 3 inches in diameter. We send two heads with each machine, together with the necessary rings to fill up for different widths of cutters. Each machine is furnished with a countershaft, the tight and loose pulleys of which are 10 inches in diameter, $5\frac{1}{2}$ -inch face, and should make 850 revolutions a minute.

BELTS WHEN ORDERED.

Driving Belt, 5 inches wide, in length to suit from line shaft.

Two Upright Spindle Belts, not less than 17 feet each, $3\frac{1}{2}$ inches wide.



No. 3. EDGE MOULDING OR SHAPING MACHINE.

Weight, 1290 lbs.

This Machine is highly valued in railroad, wagon, agricultural, furniture and carpenter shops. It is a most valuable labor saving Machine for any wood working shop.

The Frame is cored throughout. The working parts are mounted on a heavy column cast in one piece.

The Spindles are extra large size, running in self oiling boxes and placed wide between the centers.

The Headstock in which they are set has long connected bearings and raise and lower in gibbed slides which can instantly be adjusted to compensate for wear. Hand Wheels placed in front of the Machine convenient to operator for raising and lowering the headstock.

The heads are of steel independent of the spindles and interchangeable. Any size heads can be used from 1½ to 3 inches in diameter. We furnish two sets of heads with straight knives with each Machine, also two pair iron rings for the table suitable for the different size heads.

The Table is made of Hard wood, glued up in alternate strips to prevent warping or shrinkage.

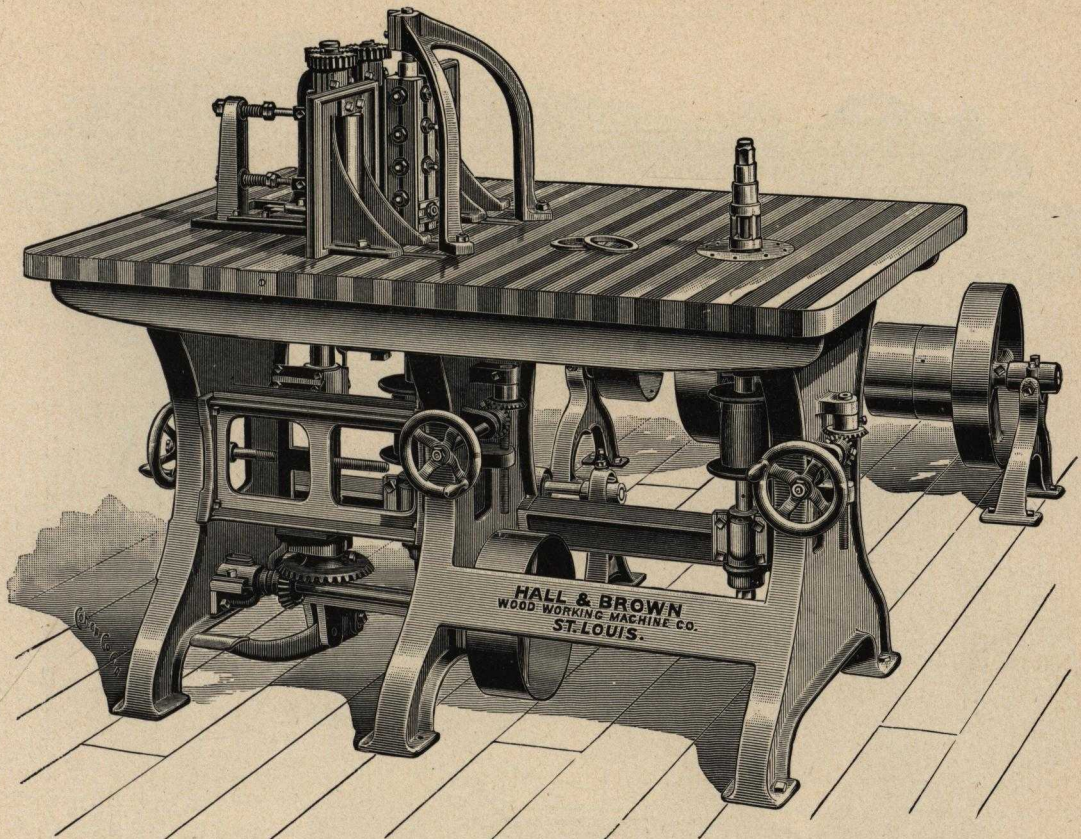
At a small additional cost iron table with concentric rings will be furnished in place of wood.

Each Machine is furnished with countershaft. Tight and Loose Pulleys are 10x5½ inches, and should make 850 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 5 inches wide, in length to suit from line shaft.

Two Upright Spindle Belts, not less than 17 feet each, 3½ inches wide.



POWER FEED SURFACER AND EDGE MOULDING OR SHAPING MACHINE.

Weight, 1800 lbs.

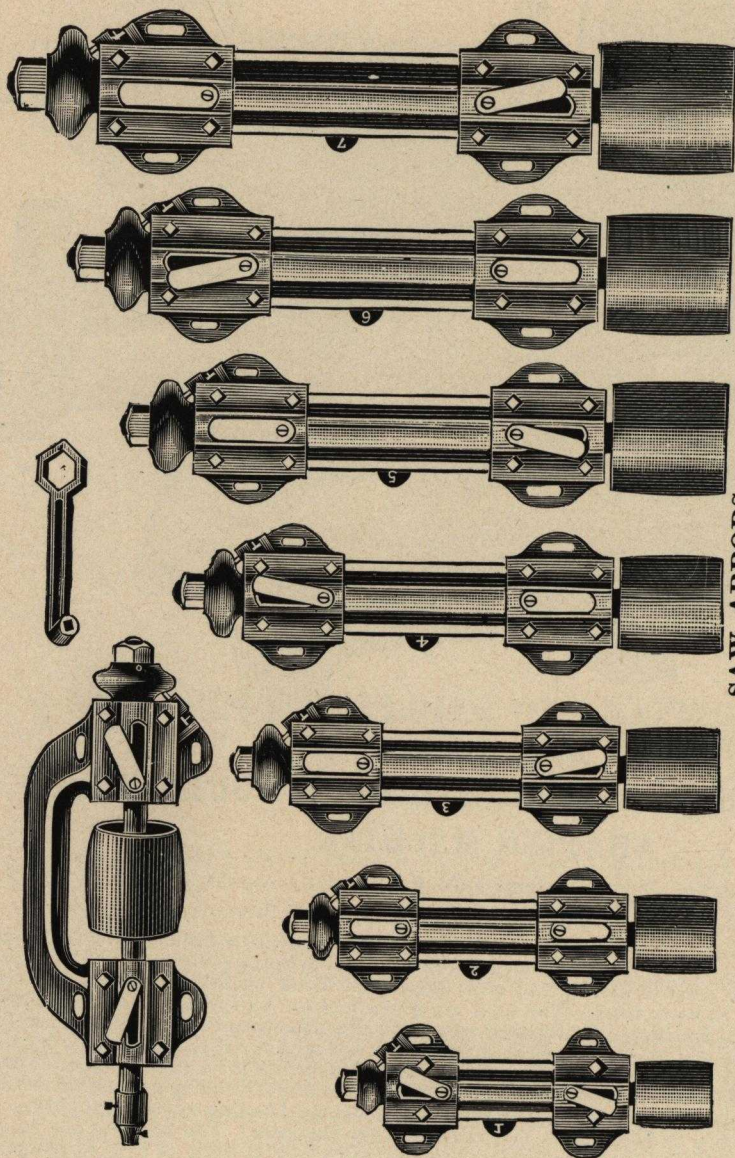
This Machine is intended to be used as a Surface and Edge Moulder combined, and by removing the feed works can be instantly converted into a Double Spindle Shaper. The left hand Spindle is provided with a set of driven feed rolls, these rolls being adjustable to suit different thicknesses of material to be worked. The rolls are given tension by springs so as to conform to any inequalities of the lumber. We furnish with each Machine one 12 inch 4-slotted head, with steel bolts and nuts and one set of straight knives, all beaders or irregular Knives for the 12 inch head being extra. We also furnish two sets of steel shaper heads for each spindle. It will be observed that a Machine arranged in this manner is capable of performing a large variety of work, in furniture or other wood-working establishments where beading or light moulding is required, such as wardrobe or bed panels and various other purposes. The spindles are large size and placed 28 inches between centers and run in self oiling boxes; each of the headstocks including the boxes in which the cutter spindles revolve are cast together and are planed up true and gibbed firmly to the frame, each having a separate vertical adjustment up or down operated by the hand wheels shown in cut. The table top is 5 feet 6 inches x 3 feet 10 inches, and can be furnished either wood or iron, (the cut showing it of wood). If made of wood it is glued up in strips of well seasoned walnut and maple and a strip of iron is let into the table extending across the table between the feed rolls and head to protect the wood from wear. Two iron rings are furnished for each spindle which are inserted in the table to reduce the opening for different size heads when used as a Double Spindle Shaper.

The Tight and Loose Pulleys are 10 inches in diameter and 5½ inch face, and should make 800 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 5 inches wide, in length to suit from line shaft.

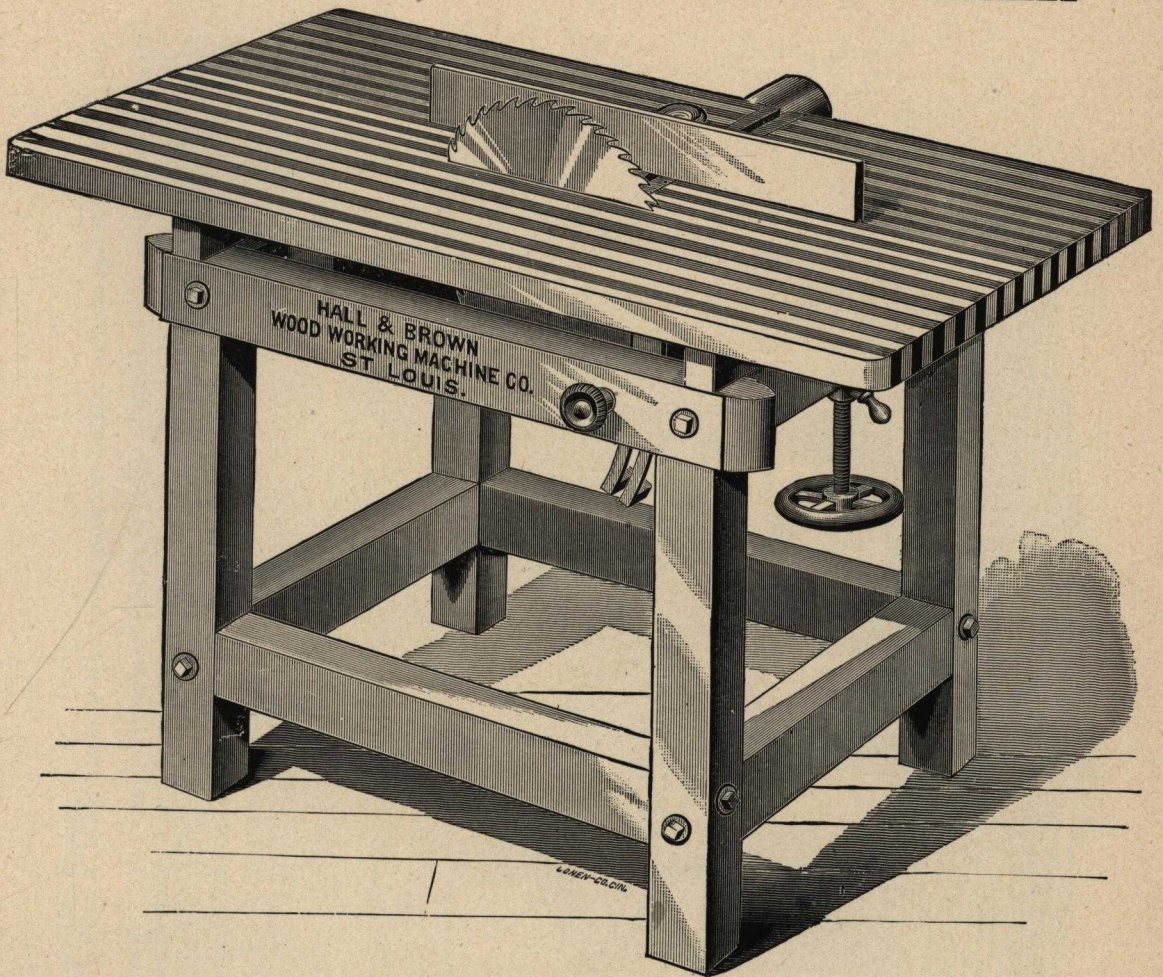
Two Upright Spindle Belts, not less than 17 feet each, 3½ inches wide.



SAW ARBORS.

The above cut represents our seven sizes of Saw Arbors. These Arbors are made of the best refined cast steel, and are finished in the best manner. The boxes are connected by a web in casting, which prevents them from getting out of line. The bearings are long, which makes them durable, and prevents springing or trembling when in use. The pulleys are turned inside and balanced. The boxes are lined with the best Babbitt Metal. We arrange the cap with a large, covered oil cup for the reception of waste or tallow, which in our experience is the best method of oiling, then there is no excuse for running the mandrel dry. The mandrel is provided with a lock to prevent its turning while removing or securing the saw. When desired, we arrange the Yoke Arbor for boring on the opposite end from saw. We send one wrench with each Arbor that fits the cap bolts and the nut for each Arbor. The cut does not represent all the styles of Saw Arbors we make. We have patterns for different styles and sizes not given here. We are prepared to make any kind of Arbors that our patrons may desire; we make them for swing-cut-off saws. We also make wide between collars to use planing dado or grover heads.

Numbers of Arbors.	Extreme Length from out to out of Journals.	Size of Mandrel.	Diameter of Pulley.	Face of Pulley.	Diameter of Collar	Hole in Saw.	PRICE.
1	12	$\frac{7}{8}$	3	$3\frac{1}{2}$	$2\frac{1}{2}$	$\frac{3}{4}$	\$7 50
2	14	1	$3\frac{1}{2}$	4	3	$\frac{3}{4}$	9 00
3	16	1	4	$4\frac{1}{2}$	$3\frac{1}{2}$	1	10 50
4	18	$1\frac{1}{2}$	$4\frac{1}{2}$	5	4	1	12 00
5	20	$1\frac{1}{2}$	5	$5\frac{1}{2}$	$4\frac{1}{2}$	$1\frac{1}{4}$	13 50
6	22	$1\frac{3}{4}$	7	$7\frac{1}{2}$	5	$1\frac{1}{2}$	15 00
7	24	$1\frac{1}{2}$	8	$8\frac{1}{2}$	$5\frac{1}{2}$	$1\frac{3}{4}$	16 50



RIP SAW BENCH.

Weight Without Counter, 350 lbs.

A first-class Rip Saw at a medium price is often in demand and to supply this want we herewith present such a Machine which is made convenient, substantial and durable.

The frame is made of well seasoned maple wood put together in the best manner with joint bolts and nuts.

The table is made of glued up strips of well seasoned walnut and maple, 5 feet 6 inches x 3 feet 6 inches, 1½ inches thick and hinged at one end which can be adjusted by a crank handle and when adjusted to the proper position it can be securely clamped. The Machine will rip 18 inches wide or less. Smaller or larger sizes will be made to order.

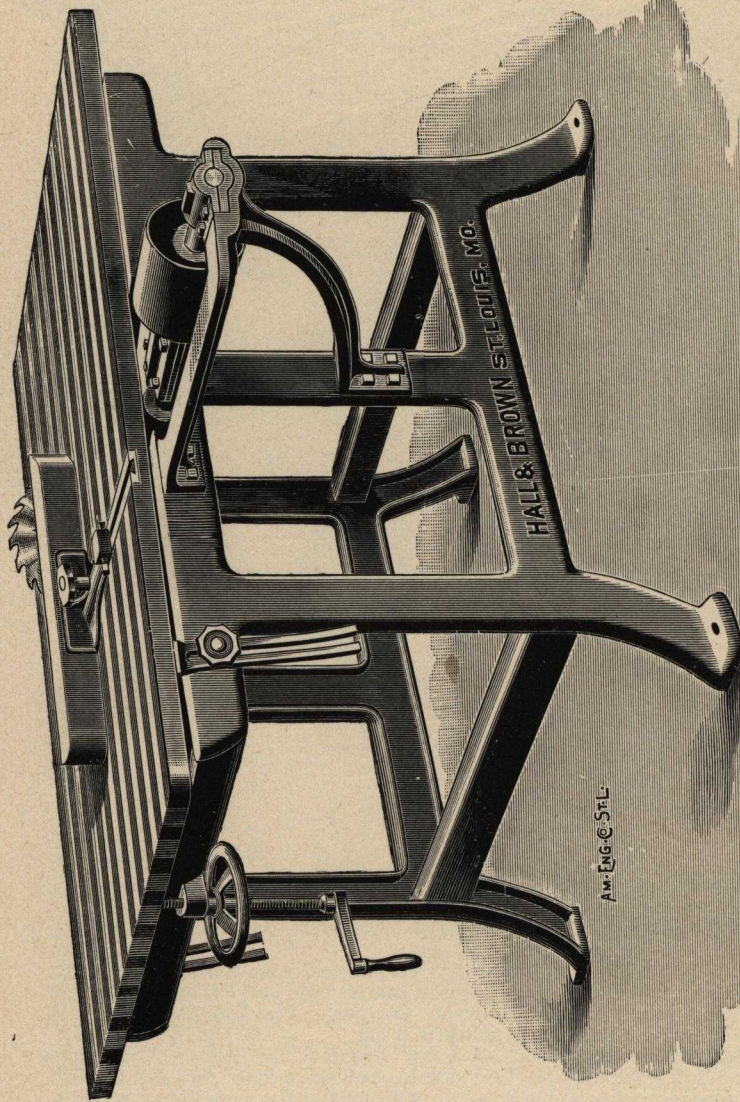
Each Machine is provided with an improved steel saw mandrel, the boxes of which are cast, connected by a heavy web and lined with the best genuine babbitt metal. We can furnish the Machine to be belted in the center between the boxes or at the end of the mandrel as ordered. Each Machine is furnished with an adjustable Saw Gauge and one 14 inch Rip Saw.

We can recommend this Saw Bench as being well suited to the wants of any Wood-working establishment where a cheap reliable Saw Bench is required.

When counter-shafts are ordered, unless otherwise advised, we shall furnish them with Tight and Loose Pulleys, 10 inches in diameter and 5½ inch face and 20 inch Drive Pulley, and should make from 700 to 750 revolutions per minute.

BELTS WHEN ORDERED.

Drive Pulley, 5 inches wide, in length to suit from line shaft and counter.

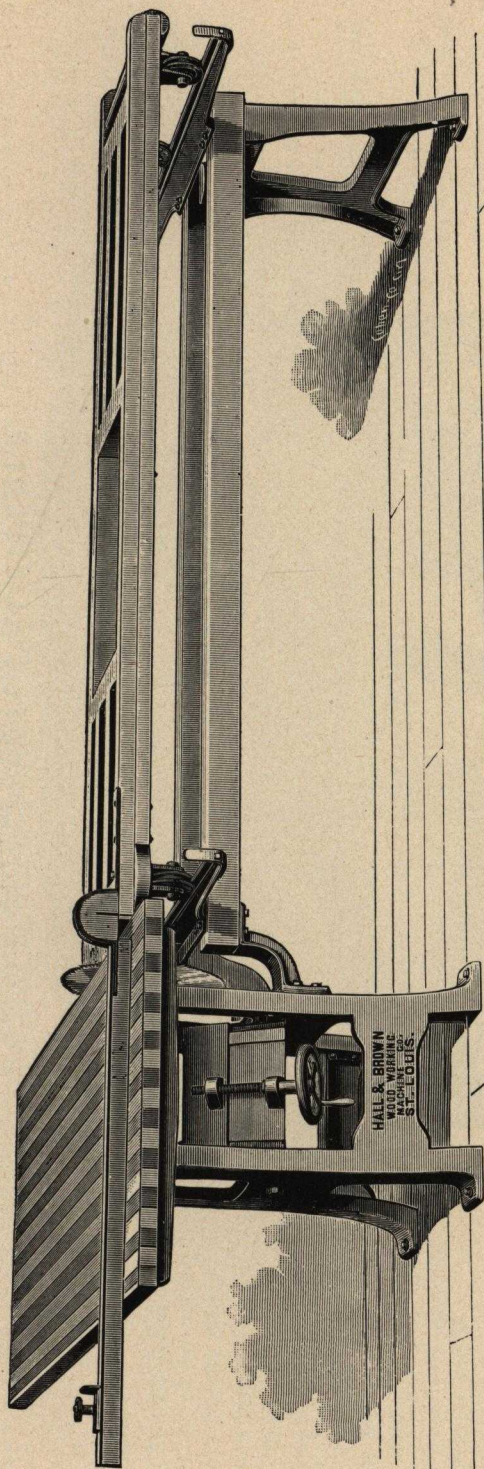


IRON FRAME RIP SAW BENCH.

Weight 600 lbs.

The frame is made of iron and strengthened with girths and ribs, to make a strong support for the mandrel. The table is made of alternate strips of hard wood to prevent shrinking or warping, and is raised and lowered by a raising screw in the front of the table. The mandrel is of the best steel and runs in connected boxes lined with the best Babitt metal. The machine will be furnished with a straight or bevel fence or rest, as desired. The machine will be found superior in every respect to the old style wood frame bench, and will be found a very reliable machine for all wood-working establishments. The pulley on the saw mandrel is 5½ inches in diameter and 6 inch face and should make about 3,000 revolutions per minute.

When counter shaft is ordered unless otherwise advised we shall furnish it with Tight and Loose pulleys 10 inches in diameter and 5½ inch face and 20 inch driver which should make 800 revolutions per minute.



CARRIAGE CUT-OFF SAWING MACHINE.

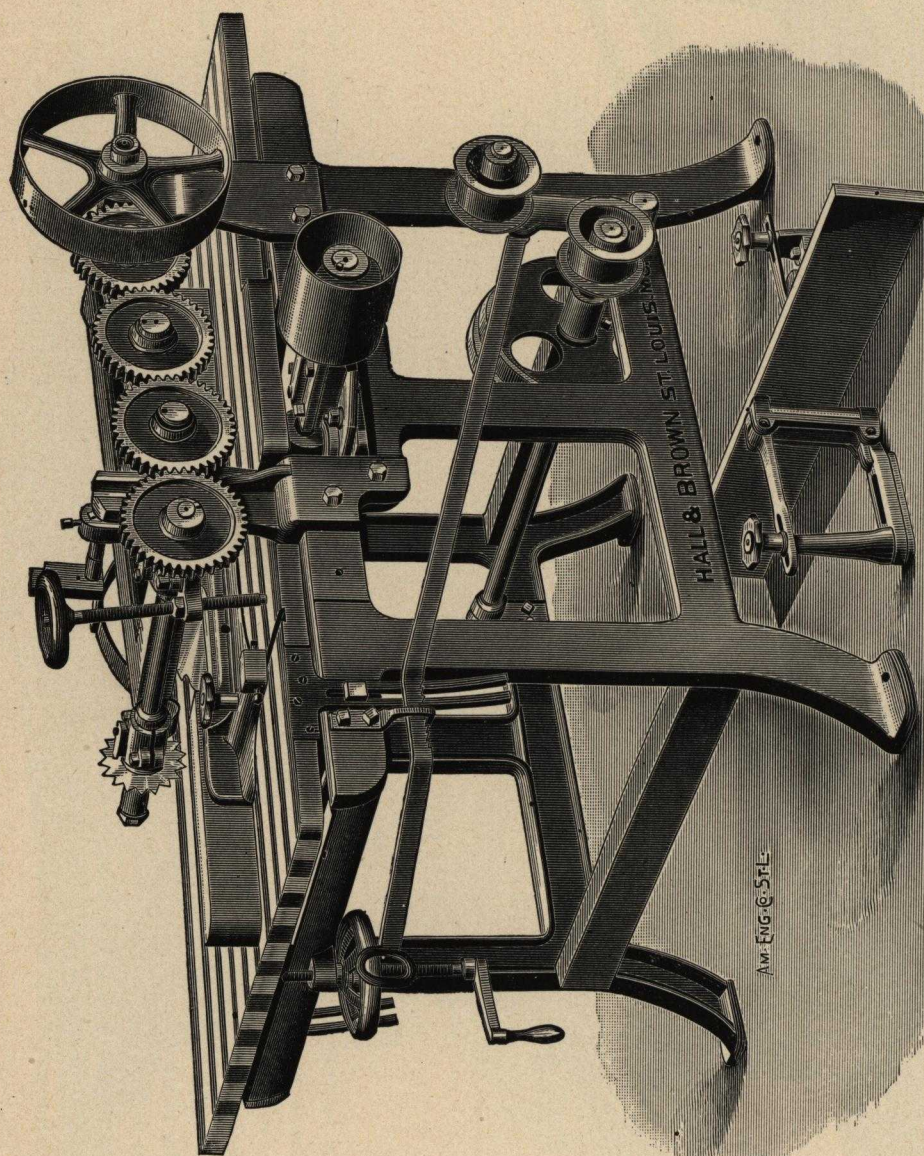
Weight, 700 lbs.

This Machine is intended for cross-cutting box lumber, sash and door stuff, or any other material that requires to be cut square and to accurate lengths. The carriage is made of wood mounted upon wheels and runs light, and of suitable length for 16 foot lumber. The Machine will cut lumber 2 feet wide or less perfectly square. The carriage is provided with an adjustable guage to get the desired length to be cut. The Saw Mandrel is of the best quality of steel, large size and runs in boxes, babbitted with the best genuine metal. The Mandrel boxes are cast to a yoke frame which is made adjustable and can be raised or lowered to suit different kinds of work. The Mandrel is made sufficiently long between nut and collar so a gaining head can be used if desired.

We furnish one 16-inch Saw with each Machine.

The Saw Mandrel Pulley is 4½ inches diameter, and 5 inch face and should make 2200 revolutions per minute.

When countershaft is ordered, unless otherwise advised it will be furnished with tight and loose Pulleys 10 inches in diameter and 5½ inch face, with a 20 inch driver and should make 500 revolutions per minute.



J.W. FERG. & SONS

No. 2. SELF-FEEDING SAW-TABLE.**Weight, 800 Pounds.**

No. 2. Self-Feeding Saw-Table.

The foregoing cut represents our No. 2. SELF-FEEDING RIP-SAW TABLE, and would call especial attention to the simplicity and durability of its construction, and will save its cost in a very short time, over the old way of ripping lumber. It takes the place of the common rip-saw table, doing all kinds of ripping in Planing Mills, Sash, Door and Furniture Factories, and will do the work of two or three common saw tables with very much less hard work.

The machine is made from new patterns, and entirely of iron and steel, except the table, which is made of alternate strips of hard wood glued up to prevent warping or shrinking.

The feed works are simple and reliable, which consists of a chain of gears arranged in a swinging frame, which is self-adjusting and readily adjusts itself to the different thicknesses of lumber.

The spur feeder is made of steel and is arranged over the lumber being ripped, and in feeding, it always gives a slight lead against the fence compelling the piece being ripped to press hard up to the gauge. The spur feeder traces the rip-saw which always takes out the kerf made by the feeder.

In case, at any time hand feed is required, the feed arm can be swung up and back out of the way of the operator.

The Saw is fully protected by a shield, there is no chance for the operator to get cut, or a piece to fly back.

The machine can be used for sawing Blind Slats, Pickets, or other small work, by using two, three or more saws in a gang.

We furnish one 14-inch Saw and one feed with each machine.

A Siding attachment can be furnished for the machine if required, for splitting straight, or bevel Siding, which will do the same work as done with a common Siding Saw; this attachment can be taken off in two minutes, thus leaving the machine a Self-Feed Ripping Saw.

The Feed Shaft is made of the best cast steel, and the feed works are started and stopped with a tightener.

The Saw Mandrel is made of the best cast steel and runs in boxes lined with the best genuine babbitt metal. The Mandrel has an outside box or support beyond the Pulley, although the cut does not show same.

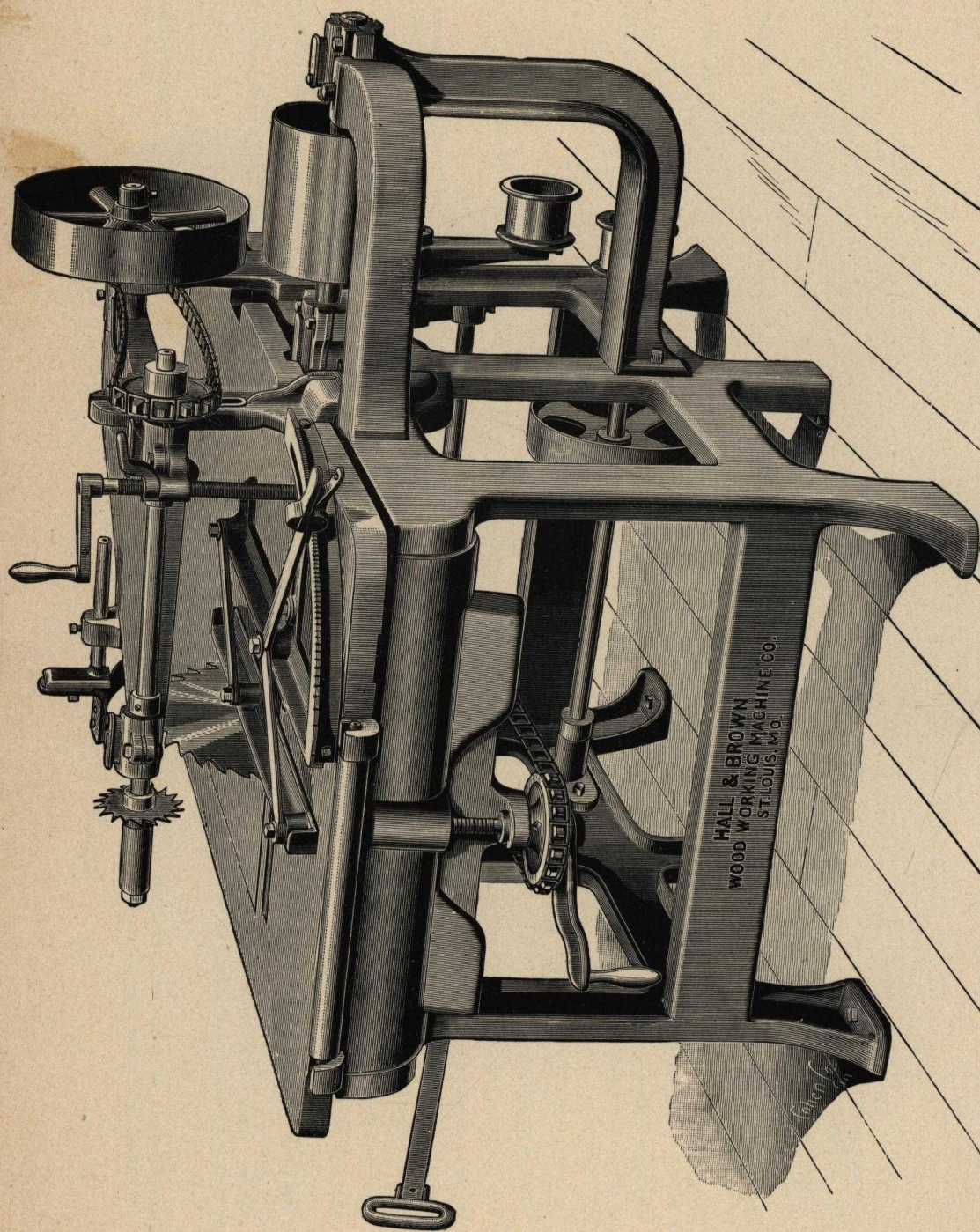
The Pulley on the Mandrel is 6 inches in diameter and $6\frac{1}{2}$ inch face and with 14 inch saw which we furnish should make 3,000 revolutions per minute.

When counter shaft is ordered, unless otherwise advised, we shall furnish it with tight and loose Pulleys 10 inches in diameter and $6\frac{1}{2}$ inch face with 20 inch driver which should make 900 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, $5\frac{1}{2}$ inches long, in length to suit from line shaft and counter.
One Feed Belt, 8 feet long, 2 inches wide.

One Feed Belt, 5 feet 6 inches long, 2 inches wide.



No. 3. SELF FEED SAW TABLE.
Weight, without Counter, 1,700 lbs.

No. 3. Self Feed Saw Table.

The Machine illustrated on opposite page represents our No. 3 Self-Feeding Saw with iron table and intended for general use in Planing Mills, Agricultural Works or Car Factories, or for other purposes where heavy ripping is required. It is built entirely of iron and steel with end rollers in table.

The table is 3x6 feet and well balanced and raises and lowers light and at all times level.

The Saw Mandrel is made of the best quality of steel, large size and supported by three Journal Boxes, one of which is placed at the extreme end of the Mandrel, outside of the Pulley, as shown in cut, and well braced, but in such a manner that the Machine can be belted from above or below. These Journal Boxes are babbitted with the best genuine babbitt metal.

The feed works are simple and reliable with two changes of feed, the spur speed shaft being driven by a link chain belt which readily adjusts itself to the different thicknesses of lumber to be ripped.

The spur feed traces the Rip Saw which always takes out the kerf made by the feeder, and is so arranged that it always gives a slight lead against the fence compelling the piece to be ripped to crowd the guide. The feed being started by a Tightener operated by the handle shown in cut.

It is provided with a superior fence or guide graduated to $\frac{1}{8}$ inch which can be instantly adjusted by the handle shown in cut, and is then held firmly in position.

A siding attachment shown on the floor in cut can be furnished with this Machine when desired.

The Machine will rip 14 inches wide and 64 inches thick, or less

We furnish with each Machine one 20-inch Saw.

The size Pulley on the Mandrel is 8 inches in diameter and 8 inches face and should make about 2300 revolutions per minute.

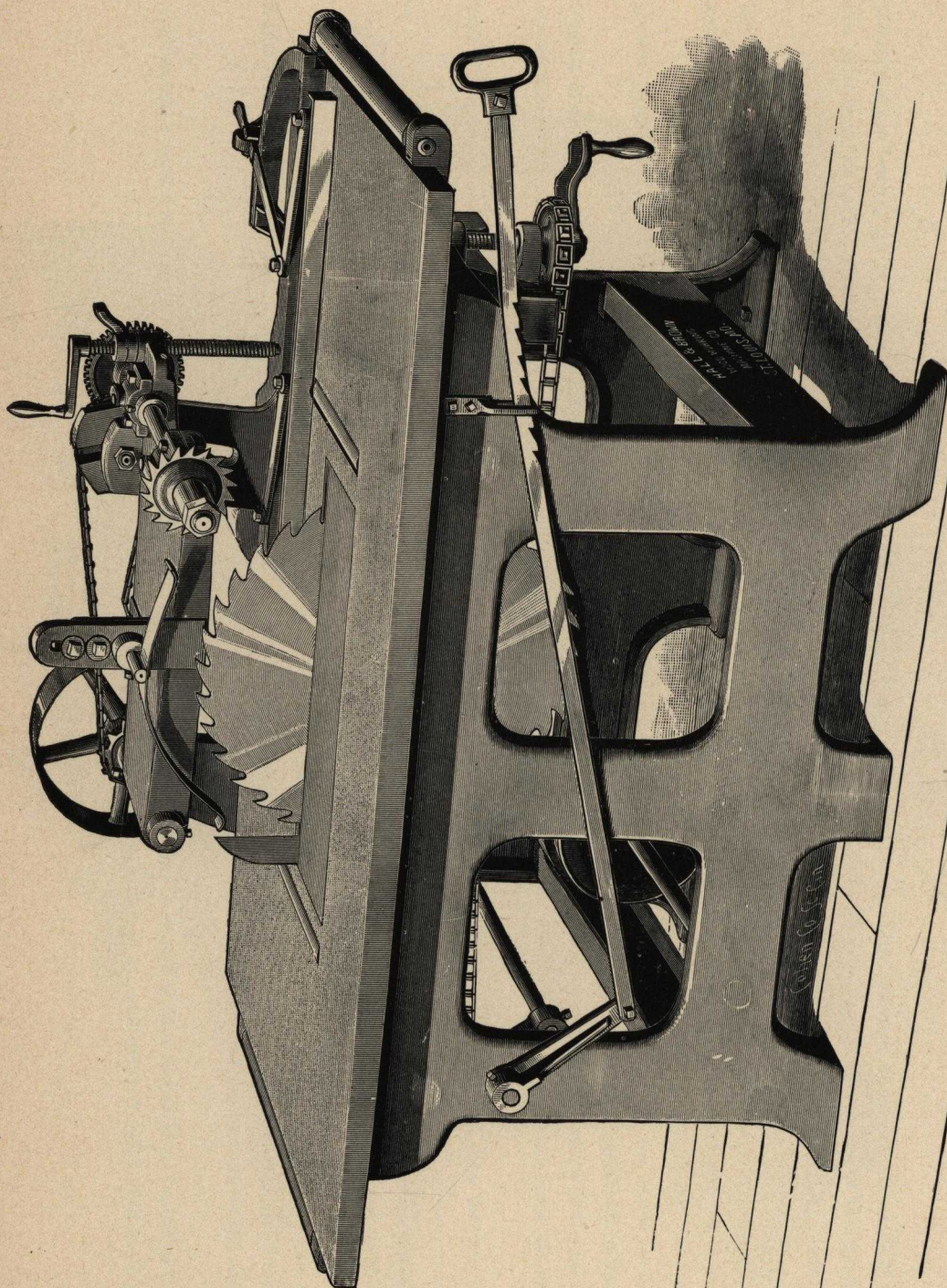
When Counter Shafts are ordered, unless otherwise advised we shall furnish them with 12x8½ Tight and Loose and 24 inch Driver, which should make 750 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belts 7 or 7½ inches wide in length to suit from Line Shaft.

One Feed Belt, 7 feet 2 inches long, 2½ inches wide.

One Feed Belt, 6 feet 1 inch long, 2 inches wide.



No. 4. SELF-FEED SAW TABLE.
Weight, 2250 lbs.

No. 4. Self Feed Saw Table.

This Machine is similar in design and construction to the one illustrated and described on the two preceding pages, except its being enlarged and increased in weight and strength throughout.

It is built entirely of iron and steel with end rollers in the table. The table is 5 feet 9 inches by 3 feet 6 inches, and is well balanced and raises and lowers light and at all times level, operated by the handle shown in cut.

The Saw Mandrel is made of the best quality of steel, large size and supported by three Journal Boxes one of which is placed at the extreme end of the Mandrel outside of the Pulley as shown in cut of No. 3, and well braced but in such a manner that the Machine can be belted from above or below. These Journal Boxes are babbitted with the best genuine babbitt metal.

The Feed Works are simple and reliable with two changes of feed, the Spur Feed Shaft being driven by a link chain belt which readily adjusts itself to the different thicknesses of lumber to be ripped.

The Spur Feed traces the Rip Saw which always takes out the kerf made by the feeder and is so arranged that it always gives a slight lead against the fence, compelled the piece to be ripped to crowd the guide. The Feed being started by a Tightener operated by the handle shown in cut.

It is provided with a superior fence or guide graduated to $\frac{1}{8}$ of an inch which can be instantly adjusted by the handle shown in cut and is then held firmly in position.

A Siding Attachment shown on the floor in cut can be furnished with this Machine when desired.

The Machine will Rip 20 inches wide and $7\frac{1}{2}$ inches thick or less.

We furnish with each Machine one 24-inch Saw.

The size of the Pulley on the Mandrel is 10 inches in diameter and $8\frac{1}{2}$ inch face and should make about 2000 revolutions per minute.

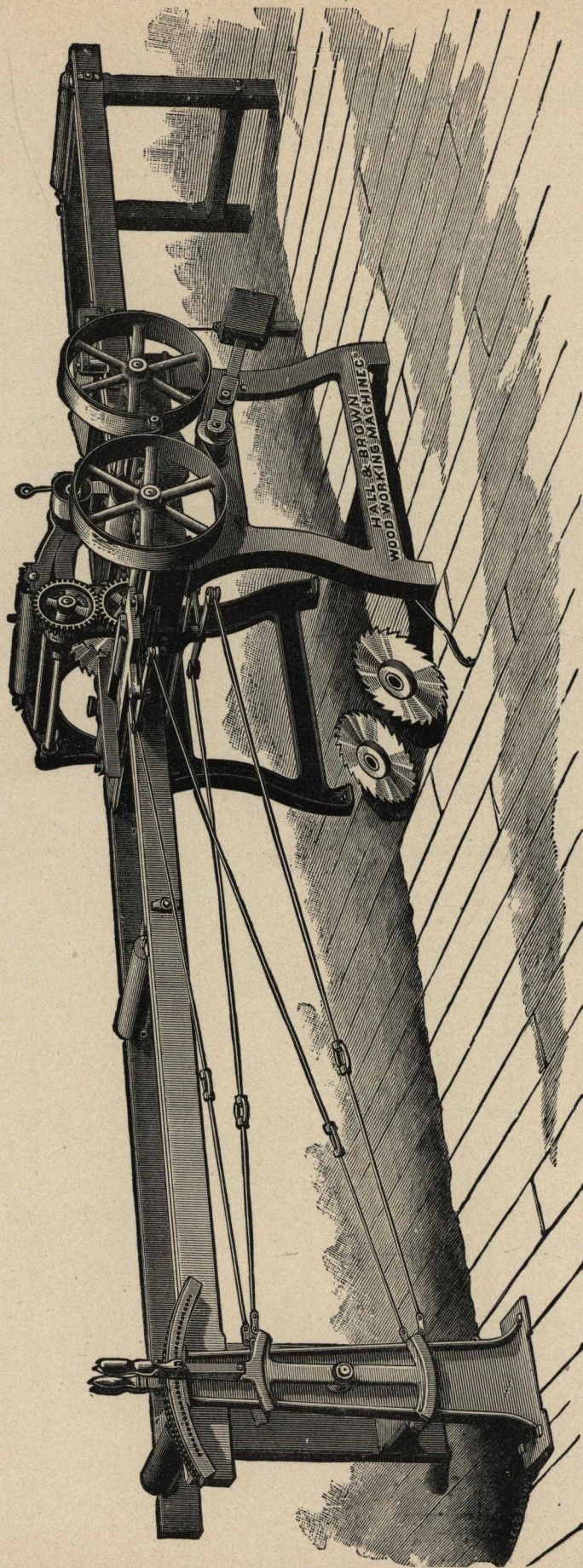
When Counter Shafts are ordered unless otherwise advised we shall furnish them with Tight and Loose Pulleys, 14 inches in diameter and $10\frac{1}{2}$ inch face and 26 inch Drive Pulley, and should make about 750 revolutions.

BELTS WHEN ORDERED.

Driving Belt, $7\frac{1}{2}$ or 8 inches wide, in length to suit from Line Shaft.

One Feed Belt, 8 feet long, $2\frac{1}{2}$ inches wide.

One Feed Belt, 6 feet 7 inches long, $2\frac{1}{2}$ inches wide.



IMPROVED SELF-FEED GANG RIPPING MACHINE.

Weight of No. 1, 26-Inch, 1500 lbs.

Weight of No. 2, 30-Inch, 1600 lbs.

Weight of No. 3, 40-Inch, 1700 lbs.

Improved Self Feed Gang Ripping Machine.

After 17 years' experience in building Gang Ripping Machines we have now got out our new and Improved Machine, which we claim has no equal in the market. It is capable of ripping 100,000 feet of stock lumber in ten hours. The Feed Rolls being all driven, it makes it a strong and positive feeder. The Arbors are made of steel, are double key-seated, and run in long self-oiling boxes. The Arbors carry two saws, one being stationary and the other is adjustable by our Improved Set Works. The Gauge is also controlled by Set Works.

An improvement we wish to call your special attention to is a Swinging End Bar with sliding box for changing saws. This is a labor saving improvement of unusual importance, and is constructed with special reference to easy access and quick change of saws. All operators will appreciate this point, as the saw can be taken off the arbor without removing a single bolt or screw, it being only necessary to loosen one nut and pull up pin, which holds the end bar in place, swing end bar around same as a gate, and you have free access to change saws. An adjusting collar is fitted on the movable saw collar so all loose motion can be taken out of the U shifter used for adjusting same; by this device all lost motion can be kept out of set works, and lumber ripped on these machines will measure same as registered on set works. The operator stands near the heavy iron floor stand, and by means of one of the levers attached to the same, has full control of the movable gauge on one side, and with the other lever the shifting saw, thus enabling him to rip stock to different widths or all the same width, leaving it optional with him and allowing him to saw each board to the best advantage.

The Feed Works have two changes of speed. Changes are easily and quickly made. A tightener with a heavy weighted lever keeps the feed belt always tight.

The floor stand is well shown in the cut, is made heavy and strong, with one lever on each side, with segmental plate on top and graduated to quarters of inches. The connections are all iron, and our improved method of adjustment allows of sawing strong or scant sizes. One of the greatest troubles with Self-Feed Gang Ripping Saws heretofore has been the board's not keeping up to the gauge as it should, thereby sawing crooked or tapering lumber. We have added a novel device to overcome this difficulty entirely. The above cut represents a Right-Hand Machine. We build them with driving pulleys and feed works and floor stand, either right or left-hand, as desired. The feed roll is large in diameter and fluted, and runs under a heavy solid binder roll.

Two stationary and two movable collars and four saws are included with each machine, thus allowing the sawyer to keep a set of sharp saws constantly on hand, and as the process of changing saws is so simple, easily and quickly done, sharp saws will be used in preference to dull ones, thus insuring smoother and nicer work.

DIRECTIONS.

Attach wooden frames to front and back of machine; then set movable gauge so a board will pass through clear of the uprights; then set stationary saw 9 1-16 in. from gauge, then adjust hand-screws on shifting rod till pin in set lever drops in hole below 9 marked in segmental plate; then set movable saw 2 1/2 in. from stationary saw; then adjust rods until pin in level drops in hole below 2 marked on segmental plate.

Be particular to have wooden rolls on frame level with the rolls on the machine. It would be advisable to start machine before putting saws on to see that the board works against the gauge as it should. Iron connecting rods are all marked, and T levers marked to correspond.

No. 1 Machine saws up to 26 in. wide, 4 in. thick; diameter of saws, 14 in.; pulley, 8 in. diam. x 8 1/2 in. face; should run 2600 revs. per minute; weight, 1400 pounds.

No. 2 Machine saws up to 30 in. wide, 4 in. thick; diameter of saws, 14 in.; pulley, 8 in. diam. x 8 1/2 in. face; should run 2600 revs. per minute; weight 1600 pounds.

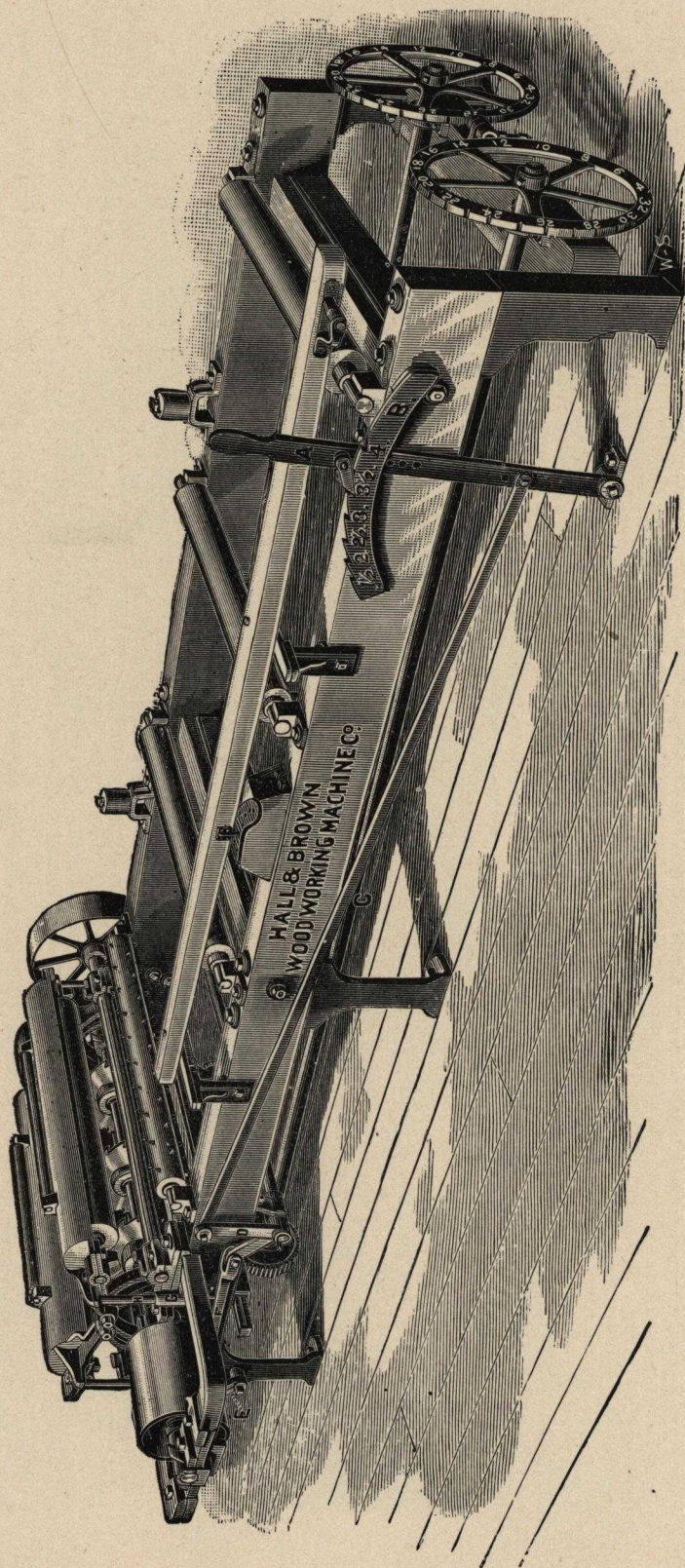
No. 3. Extra heavy, with front and back Binder Roll; both Feed Rolls fluted and driven; saws lumber up to 36 in. wide, 5 in. thick; diameter of saws, 16 in.; pulley, 10 in. diam. x 10 in. face; should run 2300 revolutions; weight, 2900 pounds.

When counter shaft is ordered unless otherwise advised it will be furnished with Tight and Loose Pulleys 12 inches in diameter and 8 inch face with 30 inch driver and should make 750 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt 8 inches wide, in length to suit from Driving Shaft.

One Feed Belt 5 feet long 3 inches wide.

**IMPROVED GANG EDGER.**

Weight, 3,000 lbs.

Improved Gang Edger.

We offer a Gang Edger to the trade that we believe will meet all the requirements of the mill men, viz: Accuracy and simplicity in working and being reasonable in price, and will answer equally as well with the majority of mills as the most expensive edger made. This Edger is made in two sections, one of which (see cut) is 14 feet long and the extreme width of iron frame is 6 feet 6 inches. The other section is a table 12 feet long, for bearing off edged lumber.

The mandrel is steel, 2 7-16 inches diameter, turned perfectly true and keyseated entire length on opposite sides. The mandrel runs in three of our patent self-oiling bearings, two of which are cast in the solid frame to prevent them from getting out of line. The third bearing is placed outside of Driving Pulley on an adjustable plate, which is easily removed by loosening two bolts, so allowing mandrel to be taken out sideways without removing caps. The adjustable plate is so made that it is impossible to get the third bearing out of line in replacing the plate. We place three bearings to prevent springing of mandrel and to divide the wear on journals caused by heavy strain of driving belt. The saw collars holding saws are nicely turned and finished, and have two Feather Keys fitted in them, and work easily on mandrel without lost motion. The Movable Collars are slotted and have Y-shaped arms fitting closely in the slots, the arms being fastened to the racks.

The regular Drive Pulley is 10 inches diameter, 12½ inches face, but 12 or 14 inch diameter pulley furnished when desired.

The Feed Rolls are Steel, 2½ inches diameter, fluted entire length, and carry the lumber perfectly true through the Machine without marring it in the least. The motion with the Feed Rolls is given by a belt running around a small pulley on Mandrel and over two pulleys fastened to rolls.

Our improvement does away with the uncertainty of setting saws correct width apart and the tiresome lifting of one or two heavy top pressure rolls every time a board is edged, and they also save the hard jarring on the machine caused by top rolls falling on frame when the lumber has passed through.

On the cut is shown a lever (A) with pawl attached, working in arch (B), connected with crank (D) by means of rod (C). The crank (D) is connected with another crank (E) by a horizontal bar (F). In the guide brackets (G) are fitted loosely steel pins (H), the bottom of which rest on the bar (F) and the top for a support for top pressure rolls. On the opposite side of edger are two cranks and bar with guide brackets and pins placed in similar position, the two sides being connected by shaft running under machine. The teeth in the arch are laid off so each tooth represents a lift or fall on one-half inch of the top rolls. A movement of the lever (A) towards the front of edger raises the top rolls equal height, the bars (F) being parallel. It is readily seen the rolls are immediately raised to any desired height to suit the different sizes of lumber, and retained in the desired position by the pawl holding in tooth in arch. The fall of rolls cannot be over ¼ inch.

In the setting of the saws to suit the different width, the saws are moved by rack and pinion under mandrel, connected by a rod with indexed wheels in front. The rack teeth are down with the pinions underneath, to prevent them filling with sawdust, and slide in a planed frame. The teeth of pinions and racks are cut from the solid, fitting perfectly and without lost motion. The notches in the index wheels are also cut in a machine and indexed, a great improvement over the old style. One revolution of the index wheel represents exactly thirty inches travel of the saw and the wheel is held in various positions by a spring pin fitting in notches. To set for board 12 and 16 inches wide, for instance, the index wheel next to stationary saw is moved so that the notch marked 12 is held by the spring pin, and on the next wheel at the notch marked 28.

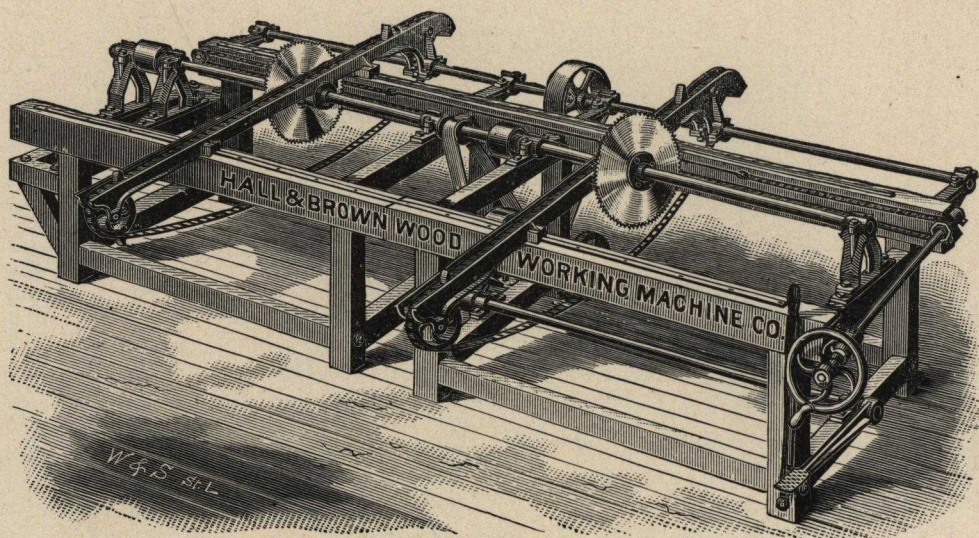
The figures are cast on index wheels, large and plain, making it almost impossible to make a mistake, and do not become difficult to see on account of the dust, as is the case where a measure board is placed over saws. The distance between outside saws is 3½ inches, and boards as narrow as 3 inches wide can be sawed. The edger is made with three or four saws, one of which is stationary. The edger mostly used is with three saws, one stationary and two movable, and with one or two top pressure rolls, as may be desired by purchaser. Solid saws, 16 inches diameter, are sent with the machines, but Chisel Bit Saws can be sent when desired, at an extra expense.

The above cut represents a left-hand Gang Edger usually used with a right-hand saw mill, and is always sent unless otherwise ordered. Right-hand edgers are furnished when ordered.

No. 1 Gang Edger has one stationary and two movable saws. No. 2 Gang Edger has two stationary and two movable saws. No. 3 Gang Edger has one stationary and three movable saws.

Capacity from 15000 to 50000 feet per day. Floor space required 26 feet x 7 feet.

The regular drive Pulley on Mandrel is 10 inches in diameter and 12½ inch face and should make from 1500 to 1800 revolutions per minute. When a 10 inch pulley is ordered for the Mandrel it should be driven by a Pulley 40 inches in diameter and 12 inch face, making 500 revolutions per minute.



TWO-SAW LUMBER TRIMMER.

Weight 1800 to 2000 lbs., According to the Length of Machine.

It requires no argument to convince the enterprising Mill-man of the usefulness of a Trimmer, as sales can be more easily effected when lumber is accurately cut and neatly trimmed.

The value of this machine in cutting off defective ends in saving freight on surplus lengths, is considerable, and no owner of a modern mill can afford to be without one.

Mandrel is 2 3/4-16 inches in diameter, and perfectly balanced. The Mandrel and Chain Driving Shafts are coupled in the centre of the Frame, the machine being built in two sections.

Drive Pulley is 7 inches in diameter by 8 inch face. This pulley can be placed in the centre of the machine or at either end; and when placed at either end we furnish an extra outside bearing, as shown in cut.

Hand Wheel on the right moves the saws one foot apart to each revolution.

Foot Lever below Hand Wheel operates the Feed Tightener.

Saws are two in number, 18 inches in diameter.

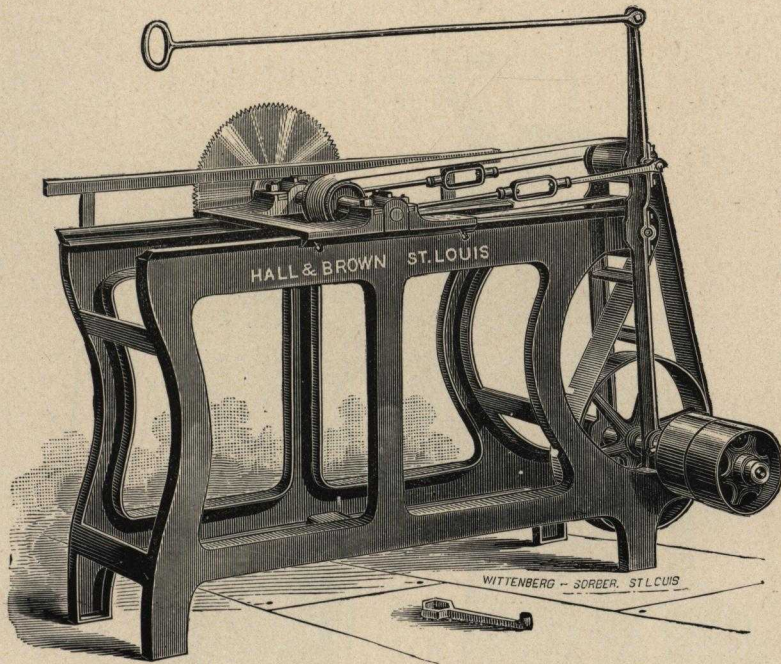
Link Belts, two in number, with attachments, and running in iron bearings, carry boards to the Saws.

The above cut represents a right hand machine.

The machine is suitable for mills with a capacity of 20,000 to 60,000 feet per day.

In ordering, be careful and give the hand of Trimmer wanted. We build them in the following sizes: To trim lumber, 8 ft. to 18 ft.; 8 ft. to 20 ft.; 8 ft. to 22 ft.; and 8 ft. to 24 ft.

When Counter Shaft is ordered, unless otherwise advised it will be furnished with Tight and Loose Pulleys, 12 inches in diameter and 8 inches face, with 24-inch Driver and should make 600 revolutions per minute.



No. 1. RAILWAY SAW.

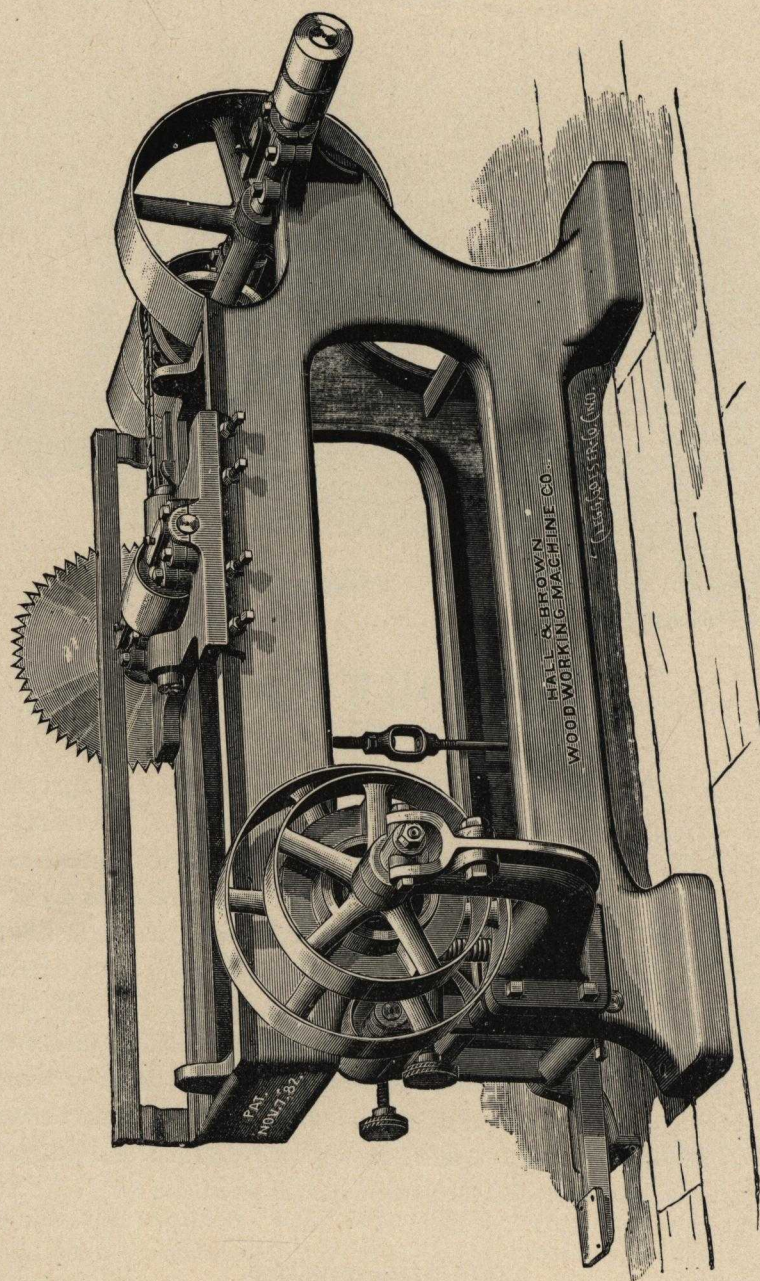
Weight, 560 lbs.

This machine is especially adapted for cutting up box boards and all light lumber, and is extensively used in door, sash, blind, cabinet and furniture manufactories. The frame is cast in one piece, and the ways planed true on the frame. The mandrill is made of the best cast steel, running in babbitted boxes cast to the sliding frame. The arrangement for drawing the saw to the work is convenient, and admits of rapid and correct work, besides preventing the loss of time in stopping the saw by crowding it too hard. The mandrill frame is arranged to run on the iron railway, and by a combination of pulleys forming a self-acting binder, the belt has always the due amount of tension. The vibrating arm is hung to the counter-shaft box and does not interfere with the box cap whatever. The counter-shaft boxes are planed on the frame with a tongue or dovetail, and can be adjusted to run the belt in the center of the pulleys. The rods connecting the vibrating arm and sliding frame are provided with nuts to tighten the belt. The tight and loose pulleys are 8 inches diameter and $4\frac{1}{2}$ inches face, and should make 650 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 4 inches wide, in length to suit from line shaft.

One Mandrel Belt, 12 feet 6 inches long, 4 inches wide.



No. 2. SELF-FEED RAILWAY CUT-OFF SAW.

Weight Without Table, 1500 lbs.

No. 2. Self-Feed Railway Cut-Off Saw.

Our new style Automatic Railway Cut-off Saw has many new advantages, and is suitable for any wood-working establishment requiring a first-class cut-off saw of this character.

The frame is one casting, cored out. The top of frame is planed perfectly true, to allow the sliding saw yoke to work back and forth in a perfect line with the table.

The mandrel is of the best cast steel, having our patent expansion device to accommodate saw with different sizes of holes. The pulley is placed on the mandrel between the bearings, which are of good length. The mandrel is driven from a countershaft on the column at the back.

Our patent automatic feed is a great feature, and the travel of the saw is at all times under the control of the operator, by a pressure of the foot upon the treadle, either long or short strokes being made with great accuracy. Any width of stock from 1 inch to 30 inches can be cut off. The saw can be held at any position, and 1 inch stock can be cut off with a $1\frac{1}{2}$ inch stroke, and by releasing the treadle the carriage returns to the extreme end of the 30 inches, or the adjustable stop can be placed so as to cut off any width desired within the limit of the machine.

The speed attained in cutting off is wonderful; one man will do three times as much work as can be done with the old style machines, and with one-fourth the labor formerly exerted.

The patent belt tightener is connected to the column, swinging from a shaft below. We recommend an endless belt for driving the saw mandrel, as all stretch can be taken up by the belt tightener, and when the saw is not running the belt can be released. The belt is always kept at an even tension, at whatever position the saw may be, and it can be run tight or loose, as may be desired, according to the thickness of stock to be cut.

There are no frictions to the machine to give trouble, and wear out, the feed being driven by belt power, which, under all circumstances, is the most simple and reliable, giving the very best of satisfaction.

We furnish this machine with or without the iron table, as may be desired; when furnished without the iron table a wrought iron rest is connected to the column, to attach the long wood table.

Tight and Loose Pulleys are 10 inches in diameter and $5\frac{1}{2}$ inch face and should make 650 revolutions per minute.

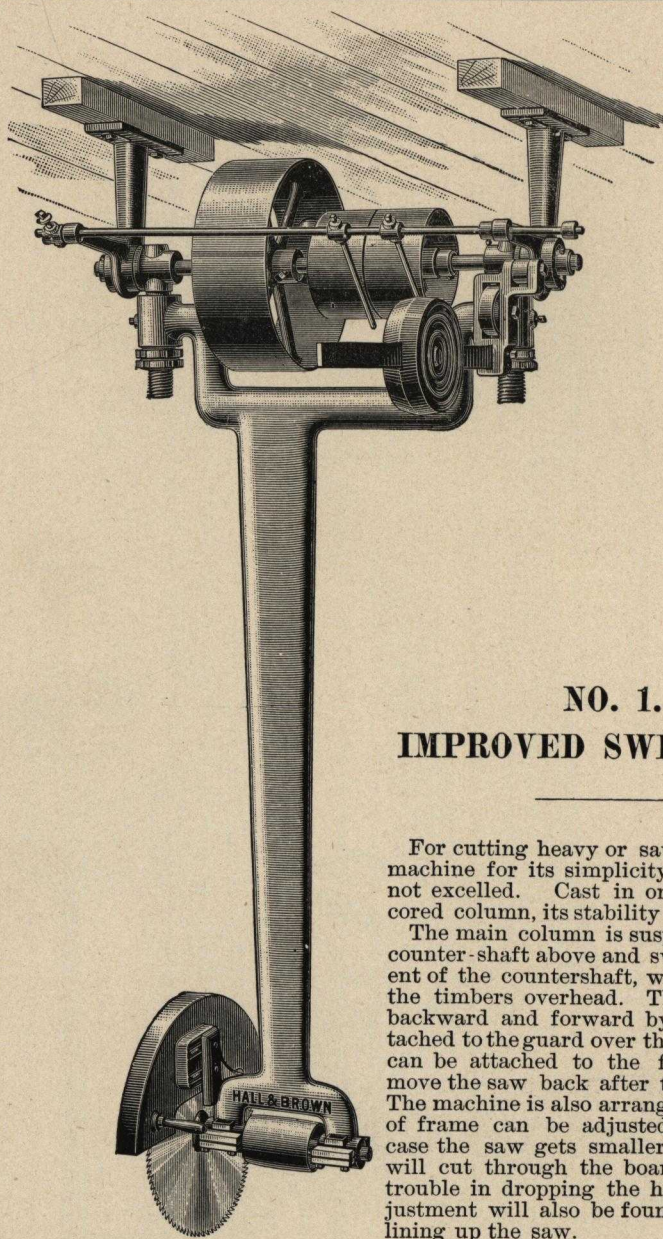
BELTS WHEN ORDERED.

Driving Belt, 5 inches wide, in length to suit from line shaft.

One Mandrel Belt, 8 feet long, 5 inches wide.

One Feed Belt 11 feet 7 inches long, $2\frac{1}{2}$ inches wide.

One Feed Belt, 11 feet 1 inch long, $2\frac{1}{2}$ inches wide.



NO. 1. IMPROVED SWING SAW.

For cutting heavy or sawed timber, this machine for its simplicity and strength is not excelled. Cast in one piece with a cored column, its stability is unquestioned.

The main column is suspended from the counter-shaft above and swings independent of the countershaft, which is bolted to the timbers overhead. The saw is moved backward and forward by a handle attached to the guard over the saw. A weight can be attached to the frame, so as to move the saw back after the cut is made. The machine is also arranged so the length of frame can be adjusted or lowered in case the saw gets smaller in filing, so it will cut through the board to avoid the trouble in dropping the hangers; this adjustment will also be found convenient in lining up the saw.

The arbor is 17-16 in. in diameter, and will carry a saw from 16 to 20 in. in diameter.

We make these Machines 6, 7, 8, 9 and 10 feet drop, measuring from the base of the Hangers where they bolt to the rafters above to the centre of the Saw Mandrel. We furnish one 16-inch saw with each Machine, unless otherwise advised.

The tight and loose Pulleys are 10 inches in diameter and $5\frac{1}{2}$ inches face and should make 600 revolutions per minute.

Weight of the 6 foot, 400 lbs. Weight of the 7 foot, 450 lbs. Weight of the 8 foot, 500 lbs. Weight of the 9 foot, 550 lbs. Weight of the 10 foot, 600 lbs.

BELTS WHEN ORDERED.

Driving Belt, 5 inches wide, in length to suit from Line Shaft.

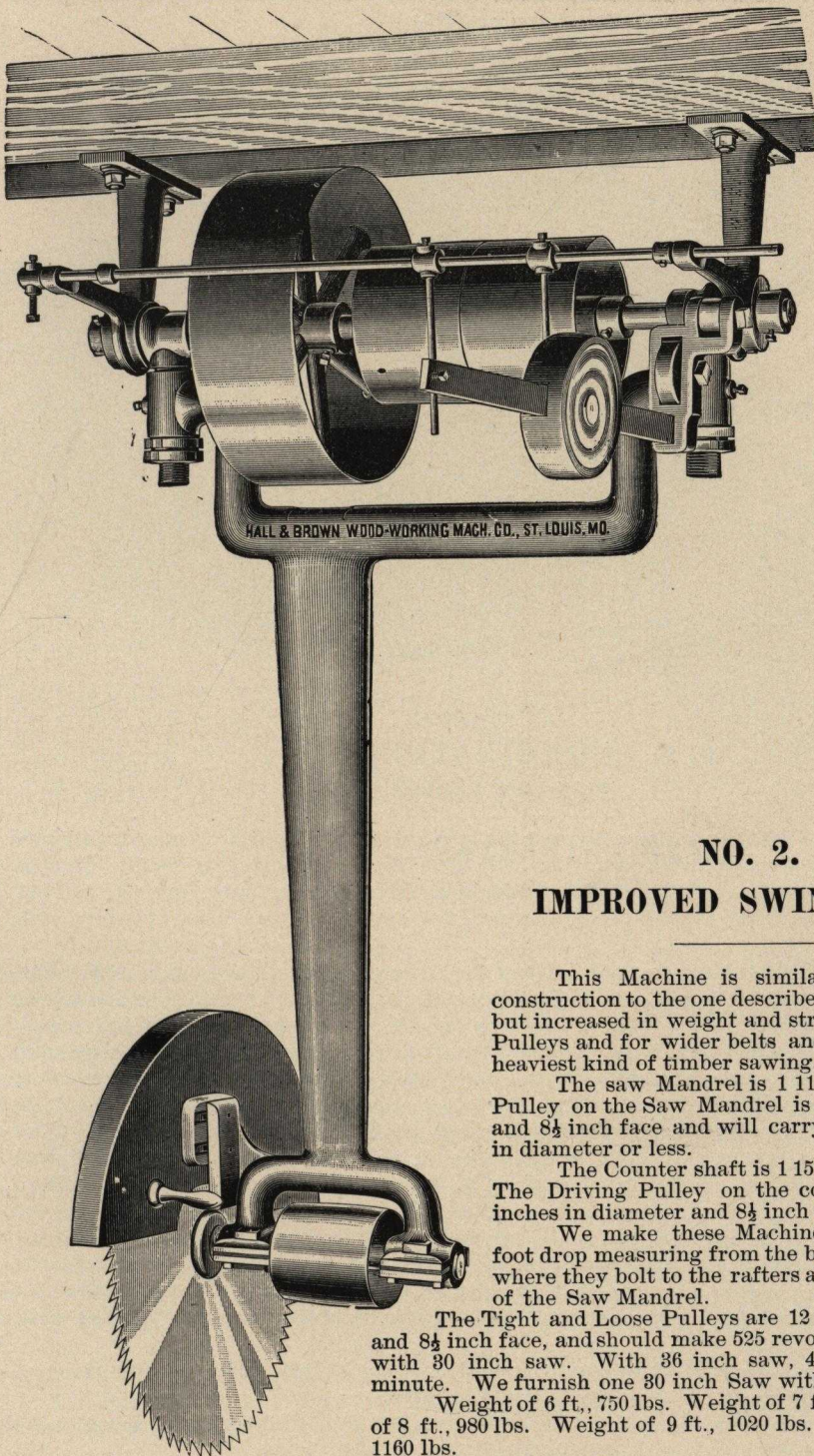
6 foot Machine, one belt, 13' 7" long, 5" wide.

7 foot Machine, one belt, 15' 7" long, 5" wide.

8 foot Machine, one belt, 17' 7" long, 5" wide.

9 foot Machine, one belt, 19' 7" long, 5" wide.

10 foot Machine, one belt, 21' 7" long, 5" wide.



NO. 2. IMPROVED SWING SAW.

This Machine is similar in design and construction to the one described on opposite page but increased in weight and strength with larger Pulleys and for wider belts and intended for the heaviest kind of timber sawing.

The saw Mandrel is 1 11-16 diameter, the Pulley on the Saw Mandrel is 8 inches diameter and 8 1/2 inch face and will carry a Saw 36 inches in diameter or less.

The Counter shaft is 1 15-16 diameter steel. The Driving Pulley on the counter shaft is 24 inches in diameter and 8 1/2 inch face.

We make these Machines 6-7-8-9 and 10 foot drop measuring from the base of the hangers where they bolt to the rafters above to the center of the Saw Mandrel.

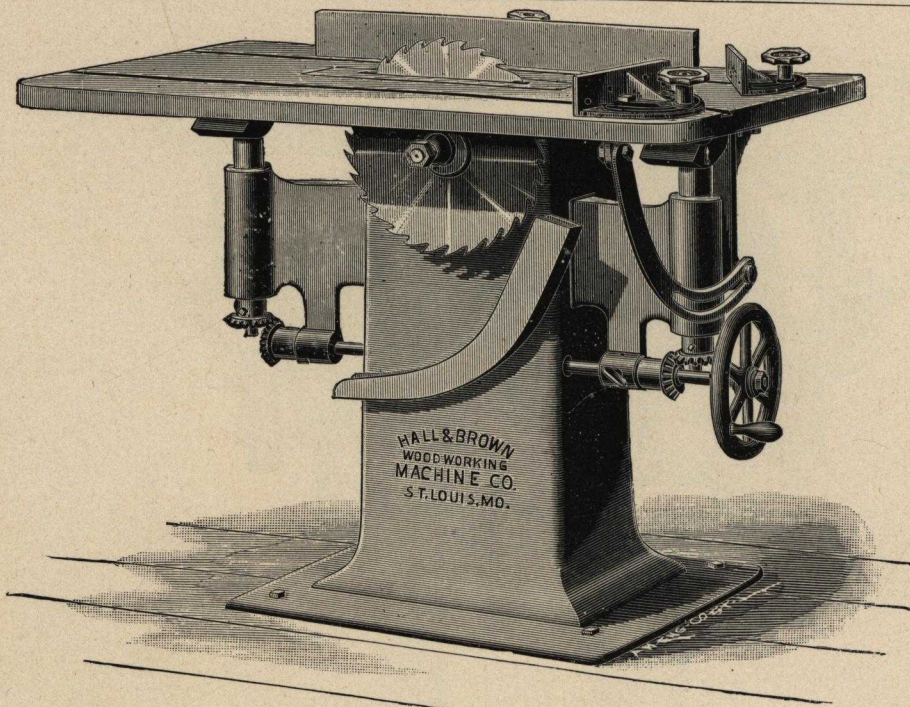
The Tight and Loose Pulleys are 12 inches in diameter and 8 1/2 inch face, and should make 525 revolutions per minute with 30 inch saw. With 36 inch saw, 450 revolutions per minute. We furnish one 30 inch Saw with each Machine.

Weight of 6 ft., 750 lbs. Weight of 7 ft., 800 lbs. Weight of 8 ft., 980 lbs. Weight of 9 ft., 1020 lbs. Weight of 10 ft., 1160 lbs.

BELTS WHEN ORDERED.

The Driving belt 8 inches wide, in length to suit from Line Shaft.
6 foot Machine, one belt 15' 4" long, 8" wide.
7 foot Machine, one belt 17' 4" long, 8" wide.
8 foot Machine, one belt 19' 4" long, 8" wide.

9 foot Machine, one belt 21' 4" long, 8" wide.
10 foot Machine, one belt 23' 4" long, 8" wide.



No. 0. COMBINATION SAW.

Weight 965 Pounds.

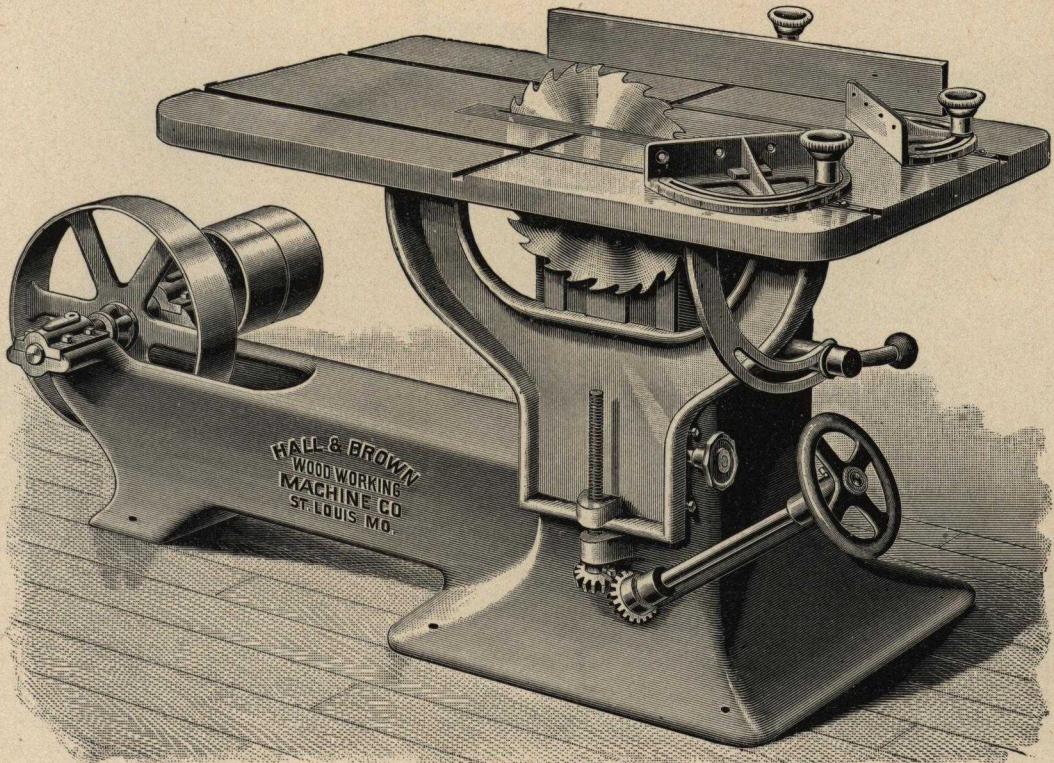
This machine has been designed to meet the wants of those who desire a machine adapted to a great variety of work, and occupying little floor space; besides it is simple, durable, compact and convenient, and is intended for ripping, cross-cutting, mitre sawing, gaining, grooving, etc. The frame consists of a hollow pedestal, cast in one piece upon which the table is firmly attached.

The saw mandrel is large size and made of the best cast steel, which runs in rigid boxes, which are babbitted with the best genuine babbitt metal. We also attach a third box or outside bearing, which is firmly bolted to the frame as a support to the mandrel on the pulley end. The iron table is three feet eight inches long and two feet eight inches wide, and is so arranged that it can be raised or lowered parallel by the hand wheel shown in cut to allow the saw or head to project any desired distance above the table, also to allow the saw or heads to be changed when desired. Two turned dovetailed pieces are fitted to the lower side of the table with corresponding bearings attached to the frame to give it a substantial bearing which permits it to be tilted or adjusted to an angle of 45 degrees, with degree marks cut in front radius, indicating the angle of the table when tilted. The table is provided with one rip saw gauge and will rip 18 inches wide, and is also provided with two cross-cut gauges. The cross-cut gauges are attached to a dovetail slide fitted to a corresponding dovetail groove in the table, each cross-cut fence can be set on angle of any degree by means of a graduated section of a circle which is marked for the purpose. All the adjustments of the table can be made while the machine is in motion.

We furnish with each Machine one 16 inch Rip and one 16 inch Cross cut saw, Gaining, Grooving, Rabbeting Heads, or other Heads would be extra.

The Pulley on the Saw Mandrel is 5 inches in diameter and $5\frac{1}{2}$ inch face and should make 2500 revolutions per minute.

When counter shaft is ordered, unless otherwise advised it will be furnished with tight and loose Pulleys 10 inch diameter and $5\frac{1}{2}$ inch face and with 20 inch driver and should make 625 revolutions per minute.



No. 1. COMBINATION SAW.

Weight, 900 lbs.

This Machine is intended for a great variety of work such as ripping, cross-cutting, beveling, mitreing, grooving, gaining, &c.

The Machine is self-contained, the frame being a cored pedestal supporting the table and with counter-shaft attached.

The iron table top is three feet 6 inches x 2 feet 6 inches, and is well ribbed and brased, and can be set at right angles with the saw, or can be adjusted to any angle up to 45 degrees. The table is raised or lowered in planed, gibbed ways with adjustments, in case of wear.

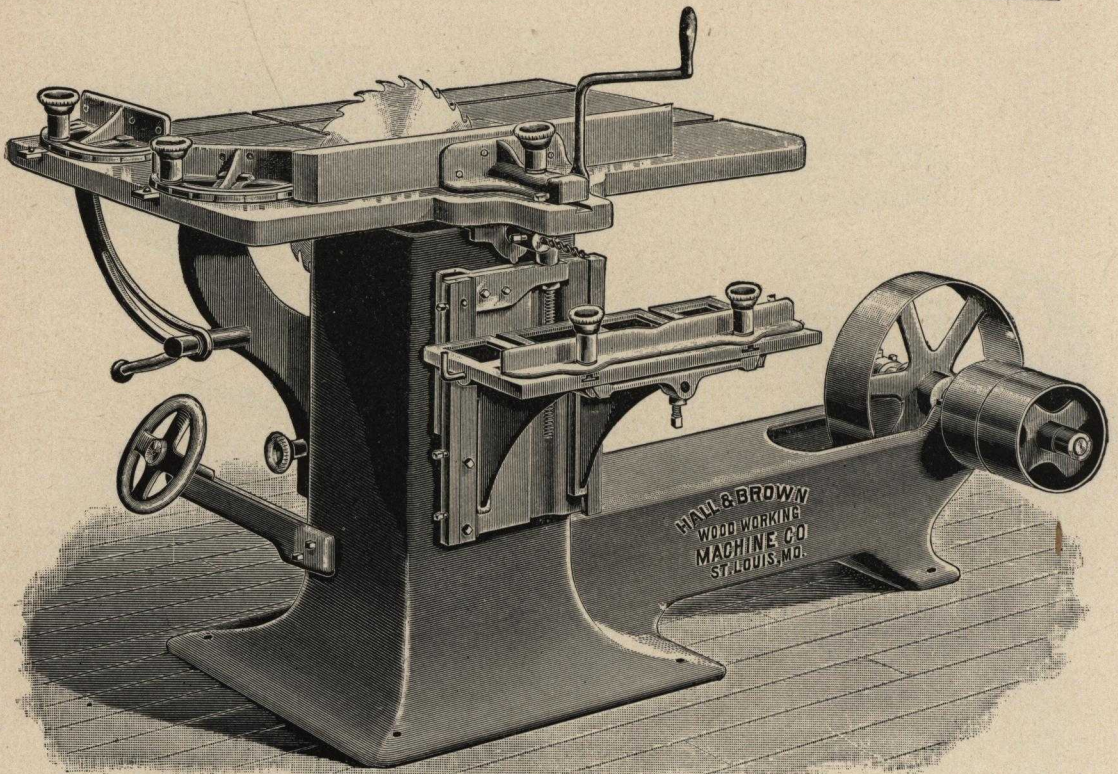
It is provided with one rip and two cross-cut gauges and will rip 14 inches wide. The cross-cut gauges are attached to a dove-tail slide fitted to a corresponding dove-tail groove in the table. Each cross-cut gauge can be set at any angle by means of a graduated section of a circle marked for the purpose. All the adjustments of the table can be made while the saw is in motion. The Saw Mandrel is large size and of the best quality of steel, and runs in boxes cast to the main pedestal or frame, which are babbitted with the best genuine babbitt. A wood block is inserted in the iron table for the saw to pass through, so that duplicate pieces can be used for gaining, or grooving. The opening in the iron table will admit the use of a saw up to 18 inches. We furnish with each Machine, one 14 inch rip and one 14 inch cross-cut Saw; gaining or grooving heads would be extra.

The Tight and Loose Pulleys are 8 inches in diameter and $4\frac{1}{2}$ inch face and should make 725 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 4 inches wide, in length to suit from line shaft.

One Saw Mandrel Belt, 10 feet 4 inches long, $3\frac{1}{2}$ or 4 inches wide.



No. 1. COMBINATION SAW.

With Boring Attachment.

Weight, 1025 lbs.

The above cut represents our No. 1 Combination Saw with Boring Attachment, this being the same Machine as the No. 1, illustrated and described on the preceding page, except showing how the Boring Attachment is applied, when so ordered, and when arranged in this manner it can be used for ripping, cross-cutting, mitre sawing, gaining, grooving or boring. The Boring Attachment does not interfere with the balance of the Machine in the least. The Mandrel being stationary and the saw table being adjusted separately, two men can operate the saw and boring machine without interfering with each other in the least. The Table for the Boring Attachment has a vertical adjustment so that holes can be bored to the center 12 inches thick or less.

The iron table top is 3 feet 6 inches x 2 feet 6 inches, and is well ribbed and braced, and can be set at right angles with the saw, or can be adjusted to any angle up to 45 degrees. The table is raised or lowered in planed, gibbed ways with adjustments, in case of wear.

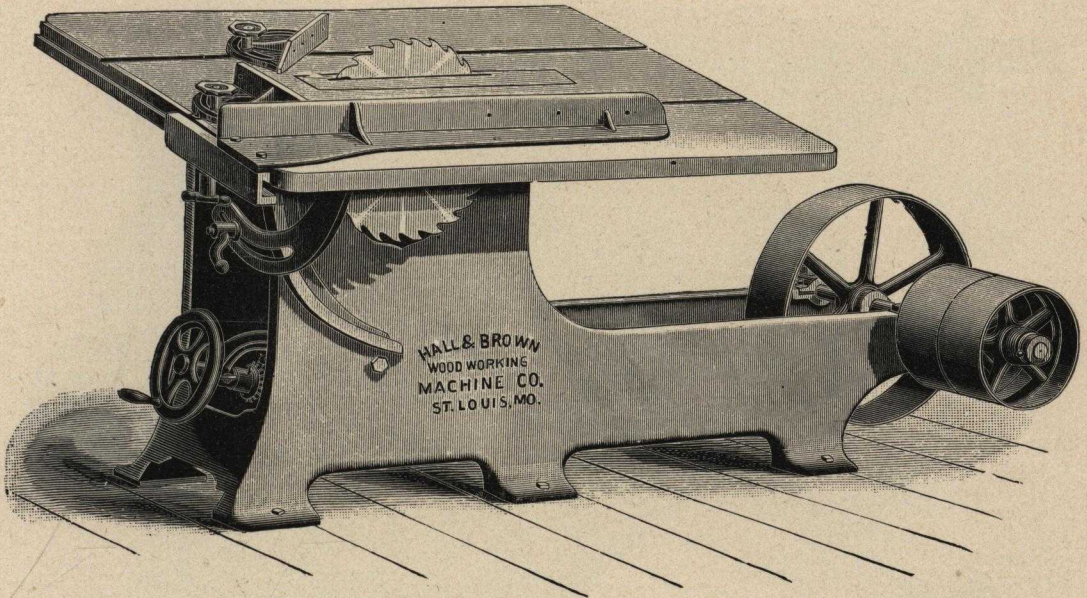
It is provided with one Rip and two Cross-cut Gauges, and will rip 14 inches wide. The cross-cut gauges are attached to a dove-tail slide fitted to a corresponding dove-tail groove in the table. Each Cross-cut Gauge can be set at any angle by means of a graduating section of a circle marked for the purpose. All the adjustments of the table can be made while the saw is in motion. The Saw Mandrel is large size and of the best quality of steel, and runs in boxes cast to the main pedestal or frame, which are babbitted with the best genuine babbitt. A wood block is inserted in the iron table for the saw to pass through, so that duplicate pieces can be used for grooving or gaining. The opening in the iron table will admit the use of a saw up to 18 inches. We furnish with each Machine, one 14 inch Rip, and one 14 inch Cross-cut Saw; Gaining or Grooving Heads would be extra.

The Tight and Loose pulleys are 8 inches in diameter, and 4½ inch face and should make 725 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 4 inches wide, in length to suit from line shaft.

One Saw Mandrel Belt, 10 feet 4 inches long, 3½ or 4 inches wide.



No. 2. COMBINATION SAW.

Weight, 1125 lbs.

The above cut represents our No. 2 Combination Saw, which is designed to be used for a variety of work, similar to our No. 1 Machine, such as ripping, cross-cutting, mitre sawing, gaining, grooving, &c., in fact combines all the necessary facilities required for cutting right and left angles, or ripping at any angle; and can be used to great advantage in nearly all wood-working establishments. The frame is made very heavy and substantial, and has the counter shaft with tight and loose pulleys attached. The iron top table is four feet long and 40 inches wide, provided with two cross-cut or mitre gauges, and one rip saw gauge, suitable for ripping up to 18 inches in width. Two turned dove-tailed pieces are fitted to the lower side of the table with corresponding bearing attached to the frame to give it a substantial bearing which permits it to be tilted or adjusted to an angle of 45 degrees, with degree marks cut in front radius, indicating the angle of the table when tilted. The table is provided with a rip saw gauge and will rip 18 inches wide, and is also provided with two cross-cut gauges. The cross-cut gauges are attached to a dove-tailed slide fitted to a corresponding dove-tail grooved in the table, each cross-cut fence can be set on angle of any degree by means of a graduated section of a circle which is marked for the purpose. All the adjustments of the table can be made while the machine is in motion.

The mandrel is large size, and made of the best cast steel, running in wide boxes lined with the best genuine babbitt metal. The mandrel boxes are cast to a frame; this frame is fitted to a dove-tail incline cast to the sides of the machine, which is planed up true for the purpose. Suitable provision is also made on these slides to take up all wear if necessary. By means of the hand wheel, shown in the cut, the saw or heads, as the case may be, can be raised or lowered, and adjusted to suit various thicknesses of material. Suitable adjustments are also provided, so in raising or lowering the saw, the same tension of the belt may be preserved.

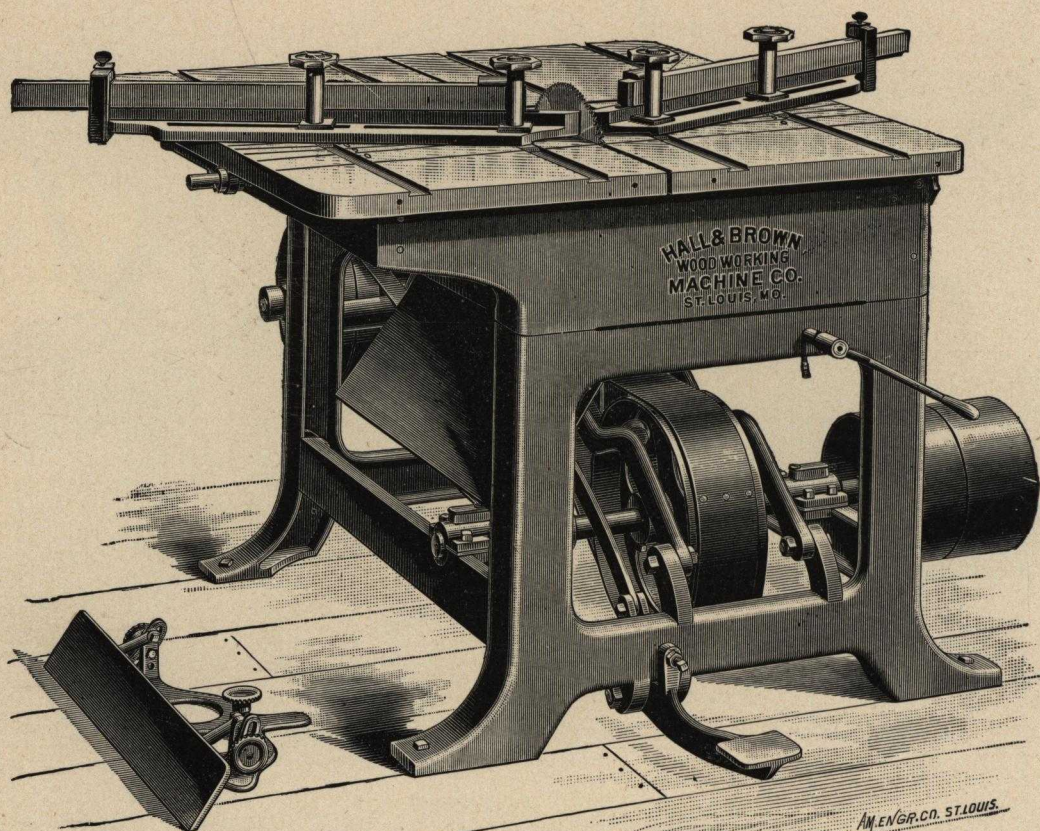
A wooden block is inserted in the iron table for the saw to pass up through, so that duplicate pieces can be used for gaining or grooving. The opening in the iron table will admit the use of a saw up to 20 inches in diameter.

We furnish with each machine one 16-inch rip and one 16-inch cross-cut saw; gaining, grooving, rabbetting or other heads would be extra. The Tight and Loose pulleys on the counter shaft are ten inches in diameter and five inch face, and should make 700 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 5 inches wide, in length to suit from line shaft.

One Saw Mandrel Belt, 12 feet 3 inches long, 4½ inches wide.



No. 3. COMBINATION SAW.

Weight, 1350 lbs.

This Machine is complete in itself, no separate countershaft being required; it is compact, combining great strength and durability, and requires but little floor space; while it will do the work of three or four Machines it occupies the space of but one.

It can be used as a Rip Saw Machine, a special gauge being furnished with each Machine for the purpose, and it will rip up to 18 inches in width, and at any angle up to 45 degrees.

For gaining, grooving, cross-cutting or mitre sawing this Machine cannot be excelled.

It is constructed entirely of iron and steel, the table tops being thick and heavy, and grooved or dove-tailed for the reception of bolts for the two cross-cut gauges, which can be set at any angle desired, the table top having graduation marks so the gauges can be set up to any angle of 45 degrees. Size of tables, 3 feet 8 inches square.

On this Machine the material is not carried to the saw or head, but the saw or head is brought forward to the work by the treadle shown in front of the Machine, the slightest pressure of the foot being sufficient to bring the saw forward, and by releasing the foot the saw returns automatically.

It will cross-cut a board 18 inches in width.

The arbor or mandrel is large size and made of the best quality of steel, which runs in long boxes lined with the best, genuine babbitt metal; these boxes are cast together or connected by a heavy yoke carriage that is fitted with rollers which operate on a track to reduce the friction.

The saw or head can be raised or lowered by the crank wrench shown in position for this purpose, in the cut.

On each side of the Machine a similar device is provided for adjusting the tables separately for the purpose of changing saws or enlarging space between the tables when gaining or grooving heads are used.

We furnish with each Machine one each, cross-cut and rip saw; gaining or grooving heads would be extra and made to order.

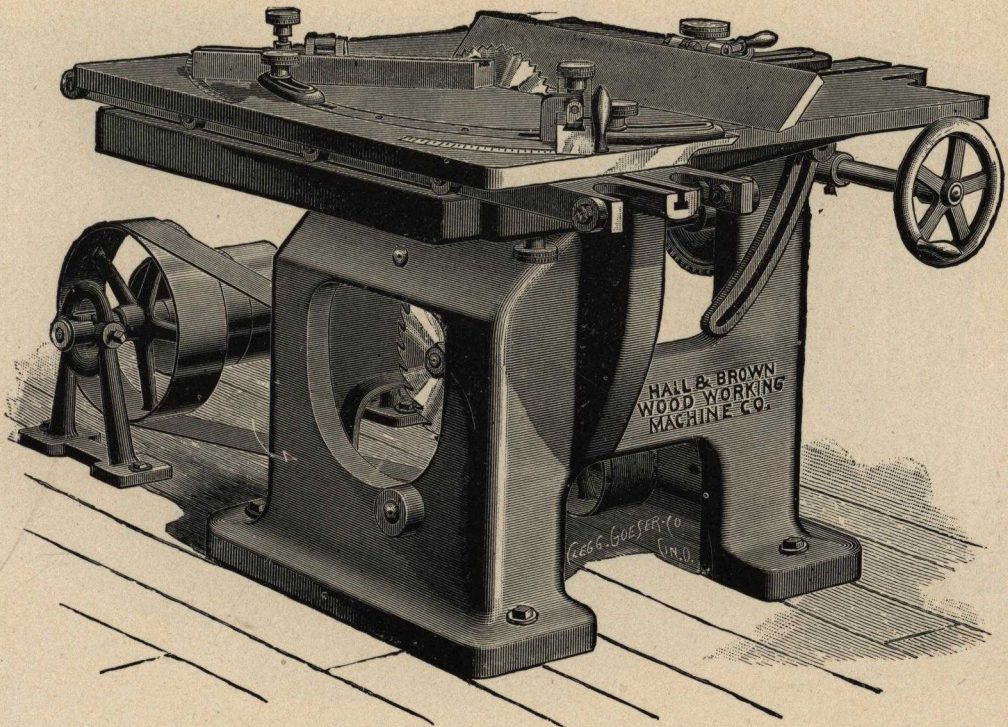
The tight and loose pulleys are 10 inches diameter and 5½ inches face, and should make 800 or 900 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 5 inches wide, in length to suit from line shaft.

One Mandrel Belt, 11' long, 4½" wide.

One Inside Belt, 8' 6" long, 2" wide.



No. 4. COMBINATION SAW.

Weight, 2000 lbs.

The above cut represents our new Improved Double Rip and Cross-Cut Saw, for edging, ripping, and cross-cutting; designed for general use, and especially adapted for pattern-makers and for accurate work. It will also be found a very useful machine for furniture and cabinet factories, sash, door and blind, also carriage factories. Its construction is very simple, and can be changed to suit the work desired in a very few minutes.

The column is one entire casting, with the saw mandrel arranged to revolve around a common center inside the column, so that when the ripping saw is above the table, the cut-off saw is below the table, and for grooving, either saw can be brought above the table according to the depth of groove to be cut.

The table is of iron, made in two sections, both sections planed perfectly true, and the one at the left of the saw made to work back and forth on rollers, for edging or cross-cutting. There are two mitre fences for cutting right and left, and one ripping fence, all accurately fitted to the table and in line with the saw.

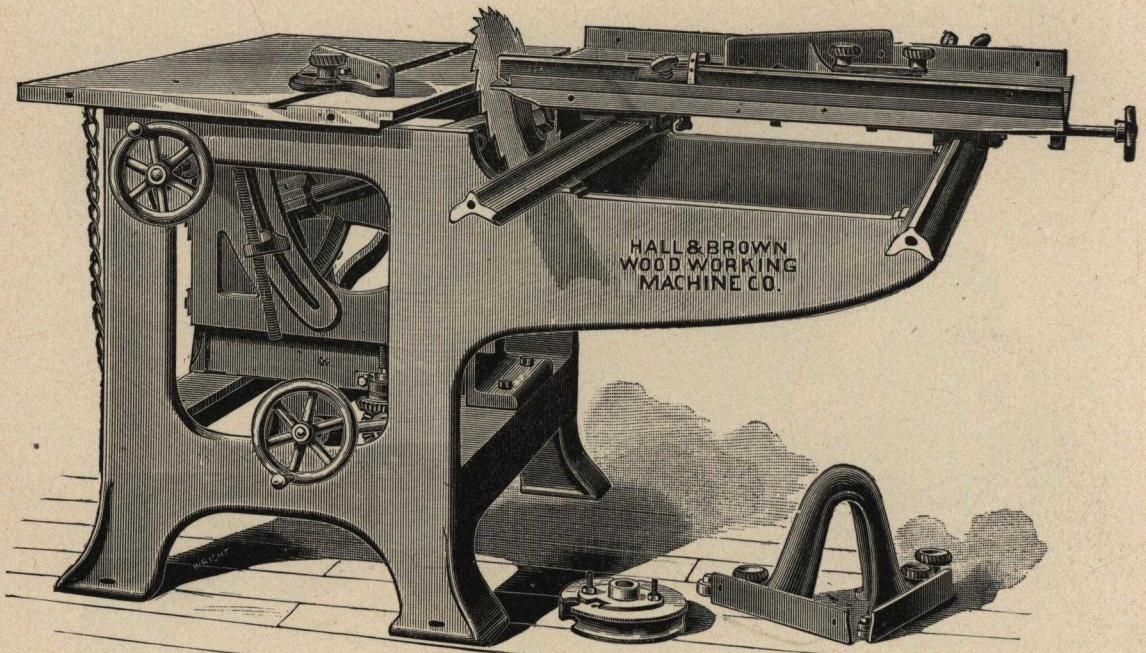
The mandrels are of the best quality of steel, running in self-oiling boxes lined with the best genuine babbitt, and driven from a counter shaft placed clear of the column, a decided improvement over all others. We can recommend this machine as the best of its kind made.

Tight and Loose Pulleys are 10 inches in diameter, $5\frac{1}{2}$ inch face and should make 560 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 5 inches wide, in length to suit from line shaft.

One Mandrel Belt, 15 feet 6 inches long, 4 inches wide.



No. 5. COMBINATION SAW.

Weight, 1400 lbs.

The above cut represents what is known as the "Robbins' Saw Bench" which is especially designed for furniture and carriage factories, moulding and planing mills, for cutting mitres and all kinds of bevels. It is so constructed that it does this class of work accurately and quickly. The machine is as well adapted to ripping, cross-cutting, and dadoing as for mitreing. It will be seen from the cut that the saw can be raised and lowered and set to any angle up to forty-five degrees. Both tables have end adjustments. The one used for cross-cutting runs on ways with roller bearings, which makes it very easy to operate. The machine is provided with all necessary guides for ripping, cross-cutting and mitreing. A compensatory idler is attached to the frame to give the proper tension to the belt at any position of the mandrel.

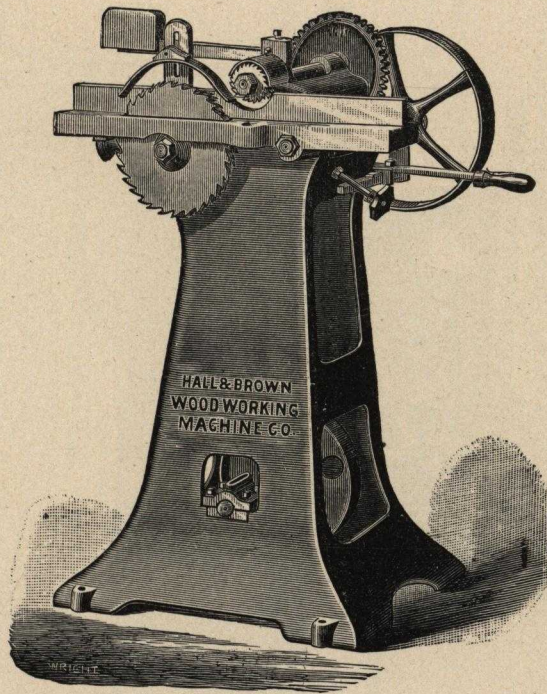
The entire machine is made of iron and steel, the frame being cast in one solid piece, very heavily braced, and will be found a decided improvement over any machine for this purpose yet placed on the market.

Tight and Loose Pulleys are 7 inches in diameter and 6 inch face and should make 800 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 5 inches wide, in length to suit from line shaft.

One Mandrel Belt, 8 feet 10 inches long, 5 inches wide.



BLIND SLAT RE-SAWING MACHINE.

Weight, 500 lbs.

This machine is designed for sawing blind slats, trunk slats, small mouldings, etc. The frame is very heavy, and is cast in one piece. The machine is furnished with either two or three ten-inch saws. The driving pulley runs between two bearings. The feed on this machine is very powerful and positive, and instead of feeding the stuff from beneath the table, it feeds from the top, thus overcoming the objectionable feature in all other slat saws, of constantly raising the stuff from the bed against the insufficient spring over it, and thus causing a waste of time and lumber when the stuff to be run is not perfectly dry. The feed is self-adjusting, accommodating itself to any thickness of stuff up to $2\frac{1}{2}$ inches, and will feed through from thirty to sixty feet of stuff per minute in any condition. The steel shield over the saws also serves as a spring to help hold the lumber down. The strips between the saws may be adjusted to run different thickness of stuff, by using extra collars. The feeding spurs are same thickness as the saws, and arranged to run directly in front of them. This machine is simple in construction and easily adjusted, and may be run by a small boy, thus saving more expensive labor.

Driving Pulleys, 4 inches in diameter, with 5-inch face, and should make 3,500 revolutions per minute.

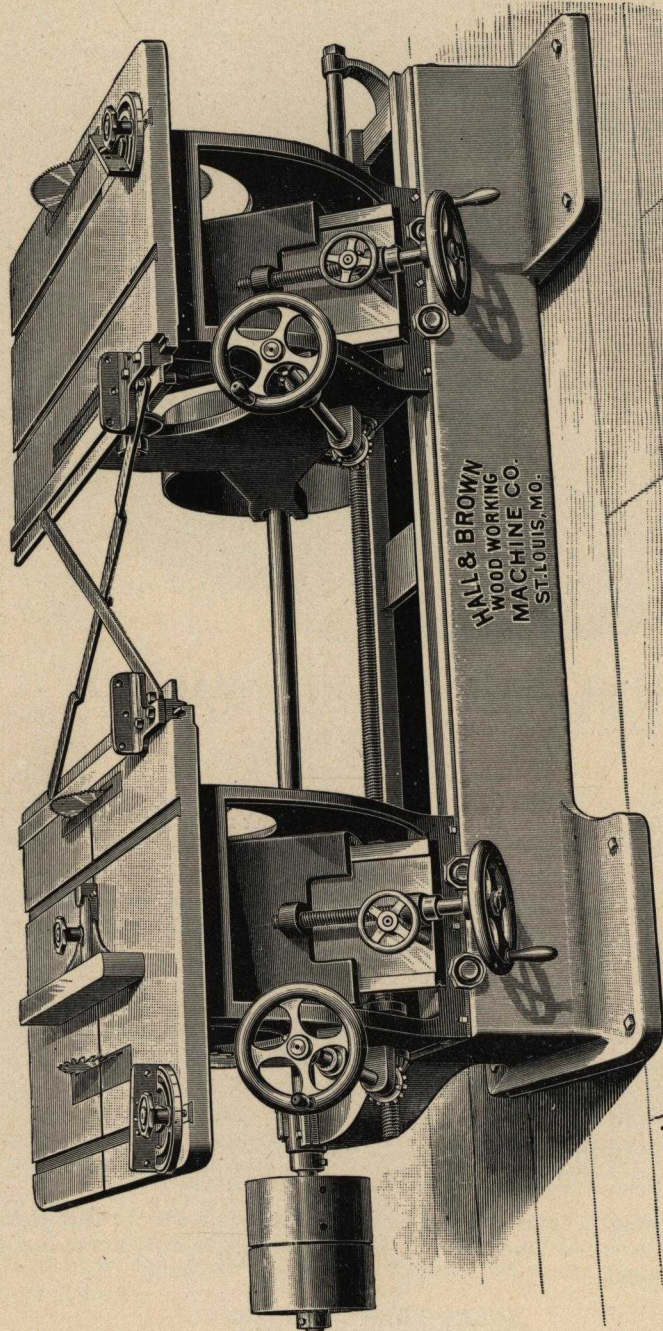
When counter shaft is ordered unless otherwise advised, it will be furnished with tight and loose Pulleys, 10 inches in diameter and 5 inches face with 20-inch driver, and should make 700 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, $4\frac{1}{2}$ inches wide, in length to suit from line shaft.

One Belt, 7 feet 1 inch long, $2\frac{1}{2}$ inches wide.

One Belt, 6 feet 6 inches long, $1\frac{1}{2}$ inches wide.



AM. ENG. CO. ST. LOUIS.

IMPROVED DOUBLE CUT-OFF SAW.

Weight, 2825 lbs.

Improved Double Cut-Off Saw.

The Double Cut-off Saw herewith illustrated will be found almost invaluable for the use of Furniture, Sash, Door, Blind, Agricultural and Car Manufacturers, and all other Wood Working Establishments, for equalizing or accurate cutting to lengths of all classes of material, and will be appreciated especially in the Furniture business for bed rails, drawer fronts, wardrobe doors and backs, and all other classes of work where it is desirable to cut both ends of the material at one operation to obtain accurate sizes for fitting; besides, the Machine can be used for various other purposes, such as ripping, grooving, gaining, ordinary cross-cutting, mitre sawing, etc.

The Machine being double and both mandrels being separate, two men can work at both ends of the machine without interfering with each other, except when double cross-cutting, then of course both ends of the Machine are used for the purpose.

The two pedestals which sustain the tables and carry the saw mandrels are both mounted on a heavy, substantial frame which is cast whole or in one piece, the top of the frame being accurately planed to receive the sliding pedestals which contains the mandrels, which is also planed true to fit.

Each pedestal is adjusted to or from the center for different lengths of material when double cross-cutting by the two hand wheels, shown at the side of each pedestal.

Each pedestal is supplied with a double end saw mandrel; each mandrel can be adjusted independently of the other, raised or lowered by the wheels shown in front to suit the material being cut, or for the purpose of removing or changing the saws.

The saw mandrels are of large size, and made of the best quality of steel and work in long boxes lined with the best genuine babbitt metal. These boxes containing the mandrel have a separate adjustment for the purpose of lining up the saws; the tables are heavy and dove-tail grooves planed out to receive the rip, cross-cut and mitre gauges; hardwood pieces are inserted in the tables where the saws project through, which can be changed or enlarged for grooving or gaining purposes.

The Machine will double cross-cut from 8 inches up to 6 feet 4 inches in length.

We furnish with each Machine two cross-cut gauges, graduated to 45 degrees, for mitre sawing; one rip saw gauge, and one long and one short gauge or fence, for double cross-cutting; one rip and two cross-cut saws with necessary wrenches to fit Machine.

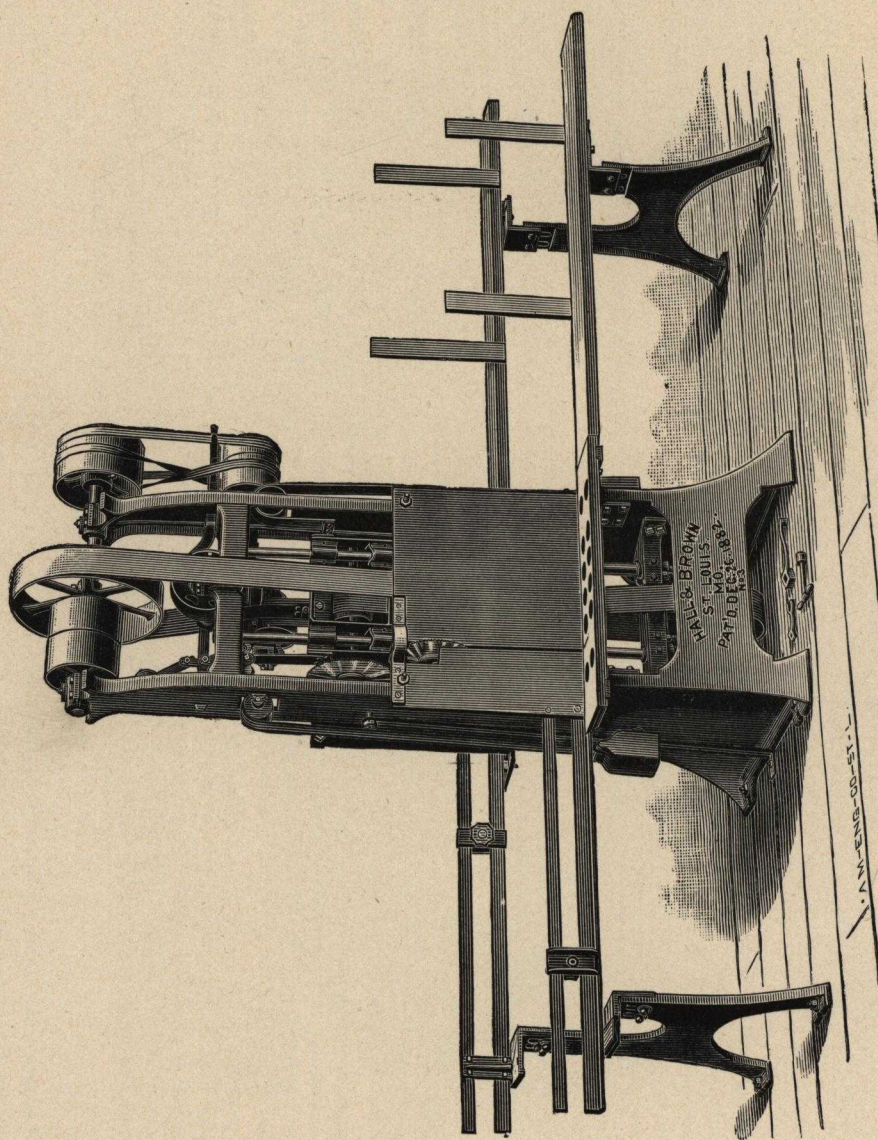
The counter shaft is steel and large size and attached to the Machine and needs no separate setting.

The tight and loose pulleys are 10 inches in diameter and 6 $\frac{1}{4}$ inches face, and should make 650 revolutions per minute.

BELTS WHEN ORDERED.

Driving belt 6 inches wide, in length to suit from line shaft.

Two Mandrel belts 9 feet 9 inches long, 5 inches wide.

**AUTOMATIC DOUBLE CUT-OFF SAW.**

Weight, 2460 Pounds.

Automatic Double Cut-Off Saw.

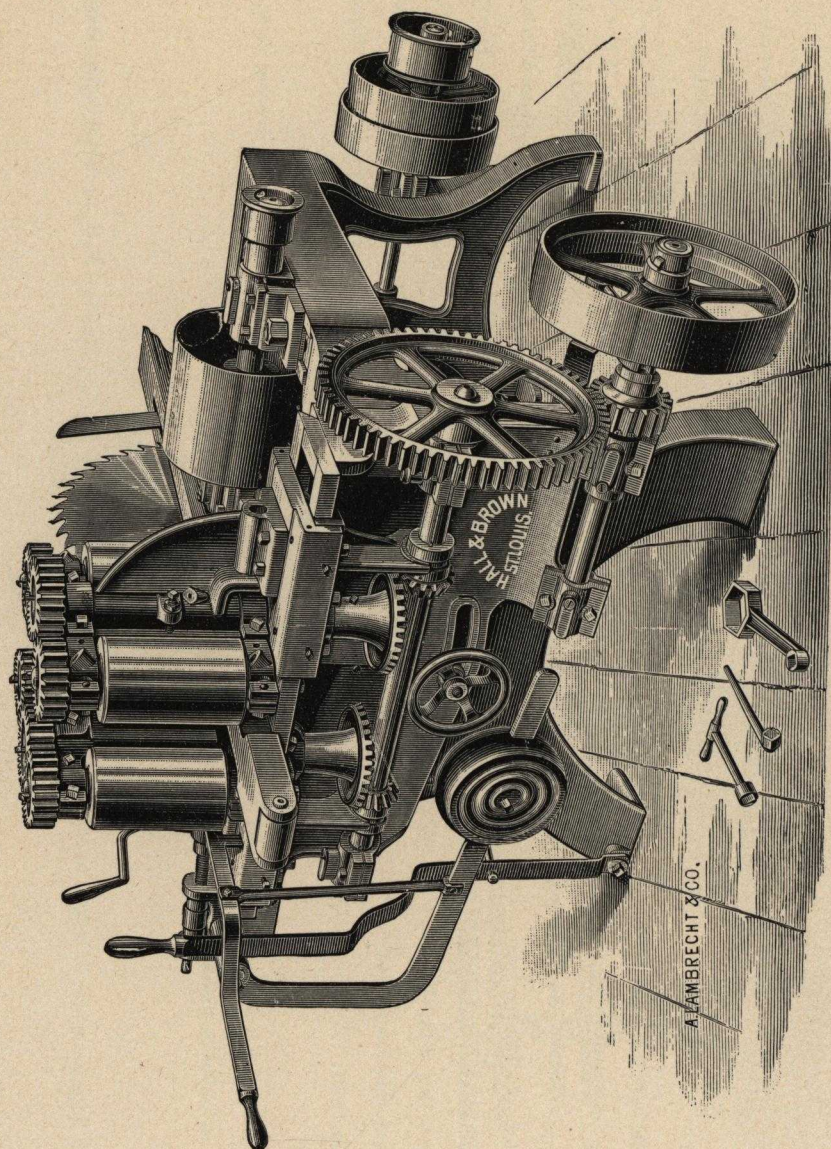
The cut on opposite page represents our new and improved Cutting-off Saw, which supplies a demand long felt by manufacturers of tobacco, cracker or other boxes where a large quantity of lumber is required to be cut square, and any desired length. It is a double machine, two saw mandrels, and two saws one at each side of the machine, thereby allowing two men to work at the machine at the same time without interfering with each other in the least. It is entirely automatic in its operation, the operator has only to thrust the board forward to the gauge to get the desired length to be cut. The machine can be adjusted to cut any desired width board from 0 up to 20 inches. The front rest for the board is adjustable to and from the saw, to be adjusted as the saws wear down, or in cutting different thicknesses of lumber. It will cut lumber in length up to 5 feet, and longer can be cut by an extension of the tables. The frame is made strong and substantial, and the working parts well balanced throughout. The shafts are all of steel, the saw mandrels being made of the best crucible steel and run in boxes lined with the best babbit metal.

Each machine is run before shipping, and each machine is belted complete as shown in cut, except the driving belt. The Tight and Loose Pulleys are 10 inches in diameter, and $5\frac{1}{4}$ inch, face, and should make 675 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt 5 inches wide, in length to suit from line shaft.

Saw Mandrel Belt, 21 feet 6 inches long, $4\frac{1}{4}$ inches wide.



No. 1. 24-INCH RE-SAWING MACHINE.

Splits 9 Inches. Weight, 1425 lbs.

No. 1. 24-Inch Re-Sawing Machine.

Splits 9 Inches.

The above cut represents our improved CIRCULAR RE-SAWING MACHINE, and claim for it superior adjustments, for doing perfect work for Planing Mills, such as Weatherboarding, Siding, etc., and can be arranged with jointing attachment, to joint one edge of the board if desired.

In its manufacture, particular attention has been given to strength in all its parts.

The frame is heavy, strong and powerful feed gearing, large pulley and wide belt.

The Saw Mandrel is made of the best cast steel, and run in adjustable babbitted boxes, which can be moved to and from the feed-rollers, in a slot planed for this purpose, at pleasure, thus keeping the saw always in line, and the cutting kerf up to the center of and nearer the rolls as the saw wears down.

The Feed Rollers (four) are strongly geared and all driven, and are governed by levers and weight, and both sets of rollers working on a cross-head, to which is attached a lever and weight, insures a perfect Self-centering, Re-Sawer, giving equal pressure from both sets of rollers, thus always presenting the center of the strip or board to the saw, no matter how great the variation in thickness.

The machine will receive lumber up to seven inches thick, and on one side or set of rollers can be locked or made rigid at will, thus leaving all the pressure on one side, which enables the operator to take a thin piece off from one side of the board.

There is but one operation required, in setting the rollers from straight to beveled work, and back again.

The Cross-head, to which is attached the Feed Rollers, swings on a section of a circle, and the center of said circle is the center of the strip to be sawed.

The rollers require no separate adjustment after being once set for angle or straight work.

The Feed works can be started or stopped at pleasure without stopping the saw.

The Saw can be taken out and replaced without taking apart any portion of the machine.

We furnish with each Machine one 24 inch taper ground saw, filed and set and thoroughly tested on the Machine before shipping.

The Pulley on the Saw Mandrel is 10 inches in diameter and 8 inch face, and should make 1,500 revolutions per minute.

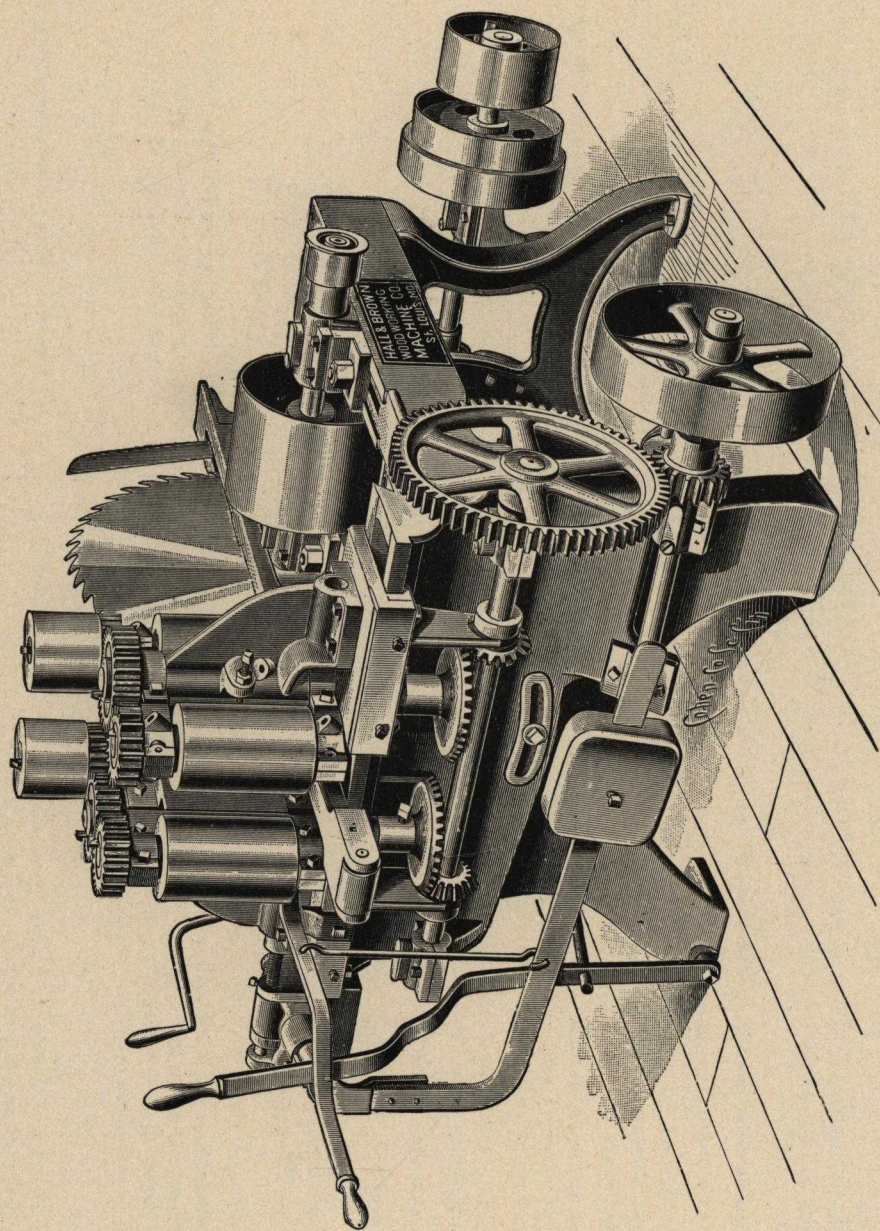
When counter shaft is ordered, unless otherwise advised, it will be furnished with Tight and Loose Pulleys 12 inches in diameter and 8 inch face, and 24 inch Driver and should make 600 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt 7 inches wide, in length to suit from line shaft or counter.

One Feed Belt 10 feet 5 inches long, $3\frac{1}{4}$ inches wide.

One Feed Belt 7 feet 2 inches long, 2 inches wide.



No. 2. 30 INCH RE-SAWING MACHINE.

Splits 12 Inches. Weight, 1,520 lbs.

No. 2. 30 Inch Re-Sawing Machine.

Splits 12 Inches.

This Machine is the same design as the No. 1 Machine except being enlarged to enable it to carry a 30 inch Saw, also the extension of the rolls to hold the increased width of the board firmly while being fed through the Machine.

It has all the necessary adjustments for doing perfect work for Planing Mills such as re-splitting, weather boarding, siding, &c. Jointing Attachment for jointing one edge of the board can be attached if desired.

The frame is heavy, particular attention being given to strength in all its parts. It has a strong and powerful feed, and the Pulleys for the Mandrel is large size with wide face.

The saw Mandrel is made of the best cast steel, and run in adjustable babbitted boxes, which can be moved to and from the feed rollers, in a slot planed for this purpose, at pleasure, thus keeping the saw always in line, and the cutting kerf up to the center of and nearer the rolls as the saw wears down.

The Feed Rollers (four) are strongly geared and all driven, and are governed by levers and weight, and both sets of rollers working on a cross-head, to which is attached a lever and a weight, insures a perfect self-centering re-sawer, giving equal pressure from both sets of rollers, thus always presenting the centre of the strip or board to the saw no matter how great the variation in thickness.

The Machine will receive lumber up to 7 inches thick, and one side or set of rollers can be locked or made rigid at will, thus leaving all the pressure on one side, which enables the operator to take a thin piece off one side of the board.

There is but one operation required in setting the rollers from straight to a beveled work and back again.

The Cross Heads to which is attached the Feed Rollers, swings on a section of a circle, and the center of said circle is the center of strip to be sawed.

The rollers require no separate adjustment after being once set for angle or straight work.

The feed works can be stopped or started at pleasure without stopping the Saw.

The saw can be taken out and replaced without taking apart any portion of the Machine.

We furnish one 30 inch taper ground Saw filed and set and thoroughly tested on the Machine before shipping.

The Driving Pulley is 10 inches in diameter and 8 inch face and should make from 1300 to 1400 revolutions per minute.

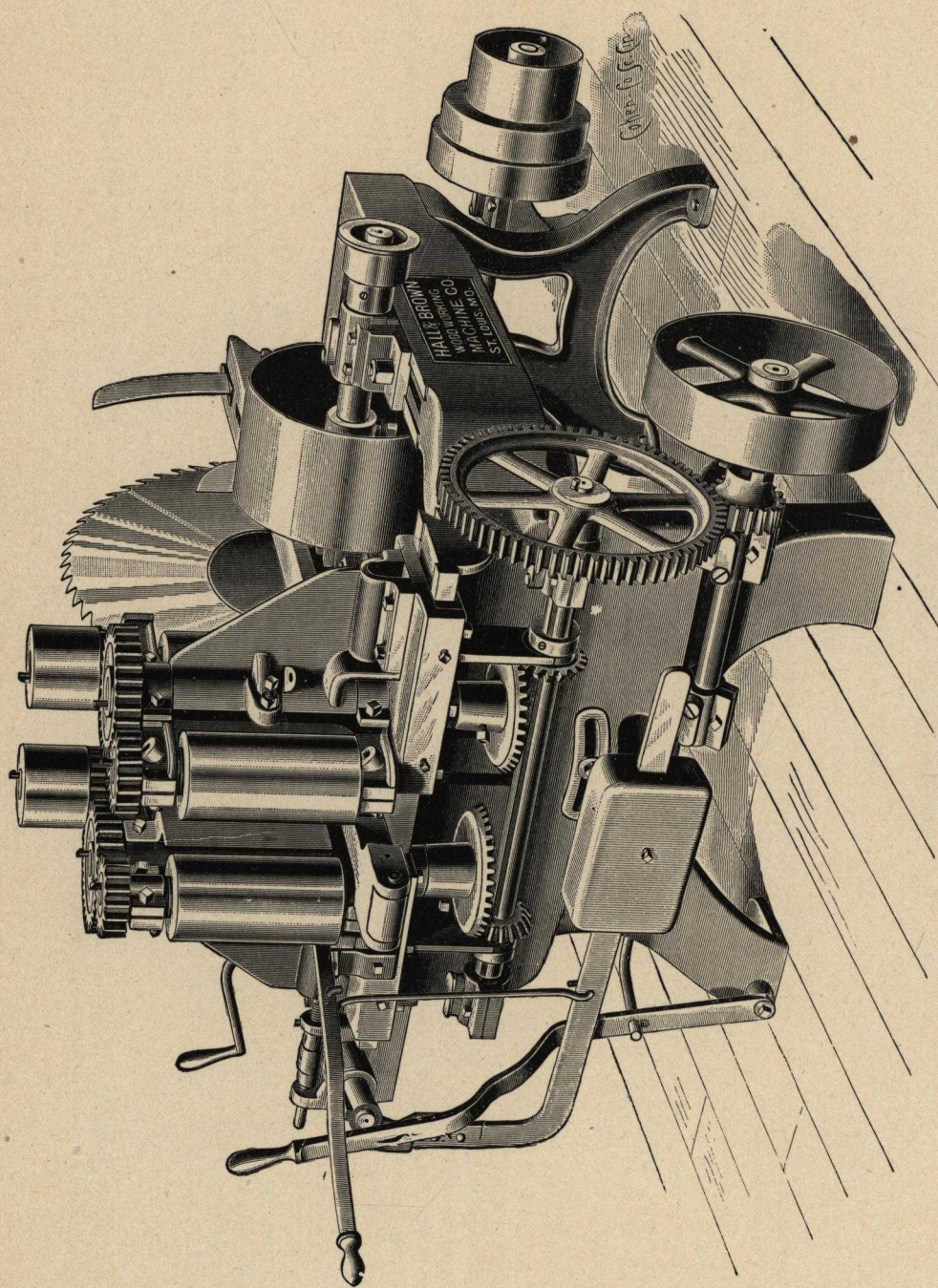
When Counter Shaft is ordered unless otherwise advised we shall furnish it with tight and loose Pulleys 12 inches in diameter and 8½ inch face and with 24 inch drive Pulley which should make 575 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt 7 inches wide, in length to suit from line shaft or counter.

One Feed Belt 10 feet 5 inches long, 3¼ inches wide.

One Feed Belt 7 feet 2 inches long, 2 inches wide.



No. 3. 36 INCH RE-SAWING MACHINE.

Steel Collared Saws. Splits 15 Inches.
Weight, 1825 Pounds.

No. 3. 36-Inch Re-Sawing Machine.

Steel Collared Saw, Splits 15 Inches.

The Machine illustrated opposite represents our 36-inch Circular Re-sawing Machine with steel collared and has many special features and advantages. It is built heavy and strong in all its parts and has a powerful feed. The Pulley on the Mandrel is large size and wide face. It is especially adapted for resplitting hard or thin lumber such as furniture material, mirror and picture frame backing, box lumber, &c.

The Saw is taper ground being 16 gauge at the rim. Two steel collars 18 inches in diameter thick at the eye, tapered down true to feather edge, are firmly rivetted, one upon each side of the Saw, thereby sustaining it and prevents its buckling.

The Saw Mandrel is made of the best cast steel, and run in adjustable babbitted boxes, which can be moved to and from the feed rollers, in a slot planed for this purpose, at pleasure, thus keeping the Saw always in line and the cutting kerf up to the centre of and nearer the rolls as the saw wears down.

The feed rollers (four) are strongly geared and all driven and are governed by levers and weight, and both sets of rollers working on a cross head, to which is attached a lever and weight insures a perfect self-centering Re-Sawer, giving equal pressure from both sets of rollers, thus always presenting the center of the strip or board to the saw no matter how great the variation in thickness.

The Machine will receive lumber up to 7 inches thick, and one side or set of rollers can be locked or made rigid at will, thus leaving all the pressure on one side, which enables the operator to take a thin piece off one side of the board.

There is but one operation required in setting the rollers from straight to beveled work and back again.

The Cross-Head to which is attached the Feed Rollers, swings on a section of a circle, and the center of said circle is the center of the strip to be sawed.

The rollers require no separate adjustment after once being set for angle or straight work.

The Feed works can be started or stopped at pleasure without stopping the saw.

The saw can be taken out and replaced without taking apart any portion of the Machine.

We furnish one 36-inch saw, filed and set and thoroughly tested on the Machine before shipping.

The Driving Pulley is 14 inches in diameter and 8 inch face and should make 1200 revolutions per minute.

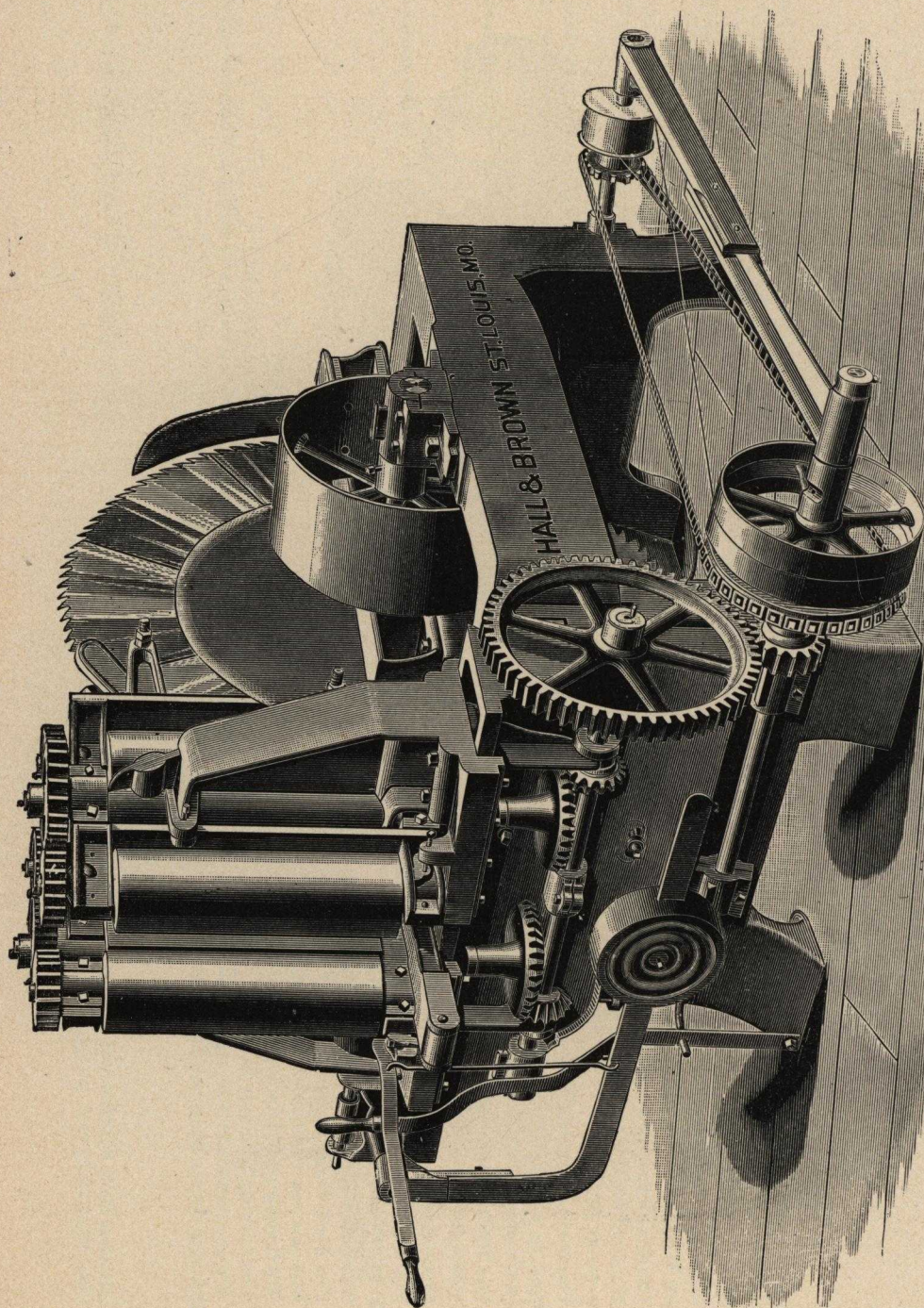
When counter shaft is ordered, unless otherwise advised it will be furnished with tight and loose Pulleys 12 inches in diameter and 8½ inch face and with driver 24 inches in diameter and 8½ inch face, which should make 700 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 8 inches wide, in length to suit from line shaft or counter.

One Feed Belt, 11 ft. 3 inches long, 3½ inches wide.

One Feed Belt, 7 ft. 8 inches long, 2½ inches wide.



No. 6. 60 INCH IMPROVED SEGMENT RE-SAWING MACHINE.

No. 4, 44 Inch Saw Splits 20 Inches, Weight, 2000 lbs.

No. 5, 54 Inch Saw Splits 25 Inches, Weight, 4130 lbs.
No. 6, 60 Inch Splits 27 Inches, Weight, 4350 lbs.

No. 6. Improved Segment Re-Sawing Machine.

The illustration on opposite page represents our 60-inch Re-Sawer, with sectional or segment Saw.

It is especially adapted to sawing thin stuff, such as box, trunk and cabinet work, mirror and picture frame backing, and for this purpose it is far superior to any other Machine made; it cuts with perfect accuracy extreme thin stuff, as well as the usual box work thickness.

We build three sizes of this style Machine, viz; No. 4, 44; No. 5, 54; No. 6, 60 inch. We also build the 44 inch Machine with steel collared saw when so ordered.

All the saws for the large size machines, viz: 44, 54 and 60 inch, are made in sections, commonly called segments, and are taper ground to No. 16 gauge. The use of segments for re-sawing is preferable in large saws to the solid plate, for the reason that when heated to a temperature that would buckle a solid saw they run just as well as when perfectly cold. This is evident from the fact that each section being independent of the other when warm expands on its own basis, and cannot consequently affect the next one by straining or buckling. Besides should any part of the saw break, as sometimes will occur, by striking a nail on any hard substance, its diameter is not diminished by cutting down and re-toothing, but the broken part can be removed and a new segment put in.

Particular attention has been given to strength, the frame is heavy with strong and powerful feed gearing, large pulleys and wide belts, which runs in adjustable babbitted boxes, which can be moved to and from the feed rollers in a slot planed for this purpose, at pleasure, thus keeping the saw always in line and the cutting kerf up to the center of and nearer the rollers as the saw wears down.

The feed rollers (four) are strongly geared and all driven, and are governed by lever and weight, and both sets of rollers working on a cross-head to which is attached a lever and weight, insures a perfect self-centering re-saw, giving equal pressure on both sets of rollers, thus always presenting the center of the strip or board to the saw, no matter how great the variation in thickness.

The machine will receive lumber up to seven inches thick and one side or set of rollers can be locked or made rigid at will, thus leaving all the pressure on one side, thus enabling the operator to slab or cut thin material from the side of the board or plank at will.

There is but one operation required in setting the rollers from straight to beveled work and back again. The cross-head, to which is attached the Feed Rollers, swings on a section of a circle, and the center of said circle is the center of the strip to be sawed.

The rollers require no separate adjustment after being once set for angle or straight work.

The Feed works can be started or stopped at pleasure without stopping the saw.

The Pulley on the Saw Mandrel of the No. 4, 44 inch is 16 inches in diameter and 9 inch face and should make 840 revolutions per minute. When counter-shaft is ordered, unless otherwise advised it will be furnished with tight and loose Pulleys 13 inches in diameter and 9 inch face with 22 inch drive and should make 600 revolutions per minute.

The Pulley on the Saw Mandrel of the No. 5, 54 inch Machine is 20 inches in diameter and 10 inch face and should make 675 revolutions per minute.

When Counter Shaft is ordered unless otherwise advised it will be furnished with tight and loose Pulleys 14 inches in diameter and 10 inch face with 24 inch Driver and should make 575 revolutions per minute.

The Pulley on the Saw Mandrel of the No. 6, 60 inch Saw is the same size as the No. 5 and should make 600 revolutions per minute.

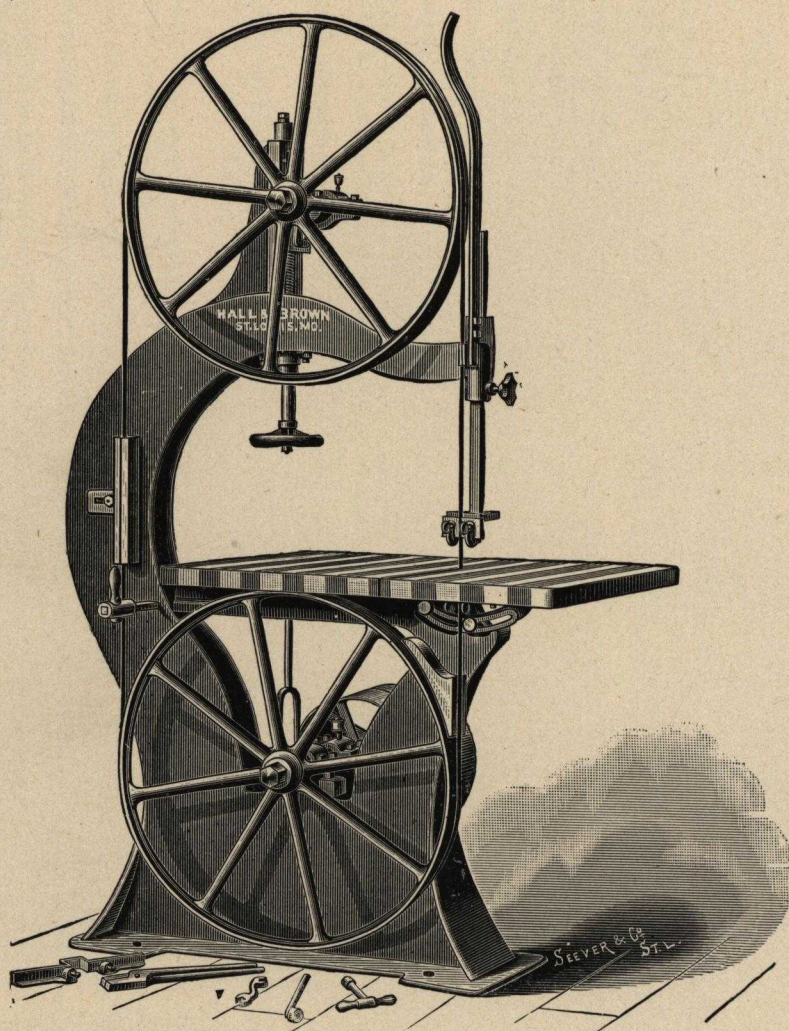
When counter shaft is ordered, unless otherwise advised the same pulleys will be used as upon the No. 5 and should make 590 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belts, in length to suit from line shaft.

One Feed Belt, 13 feet 10 inches long, 4 inches wide.

One Feed Belt, 8 feet 2 inches long, 3½ inches wide.



No. 1. BAND SAW MACHINE.

30-Inch Wheel. Weight, 1085 Pounds.

Length Blade required, 17 feet 3 inches, 1 inch wide or less.

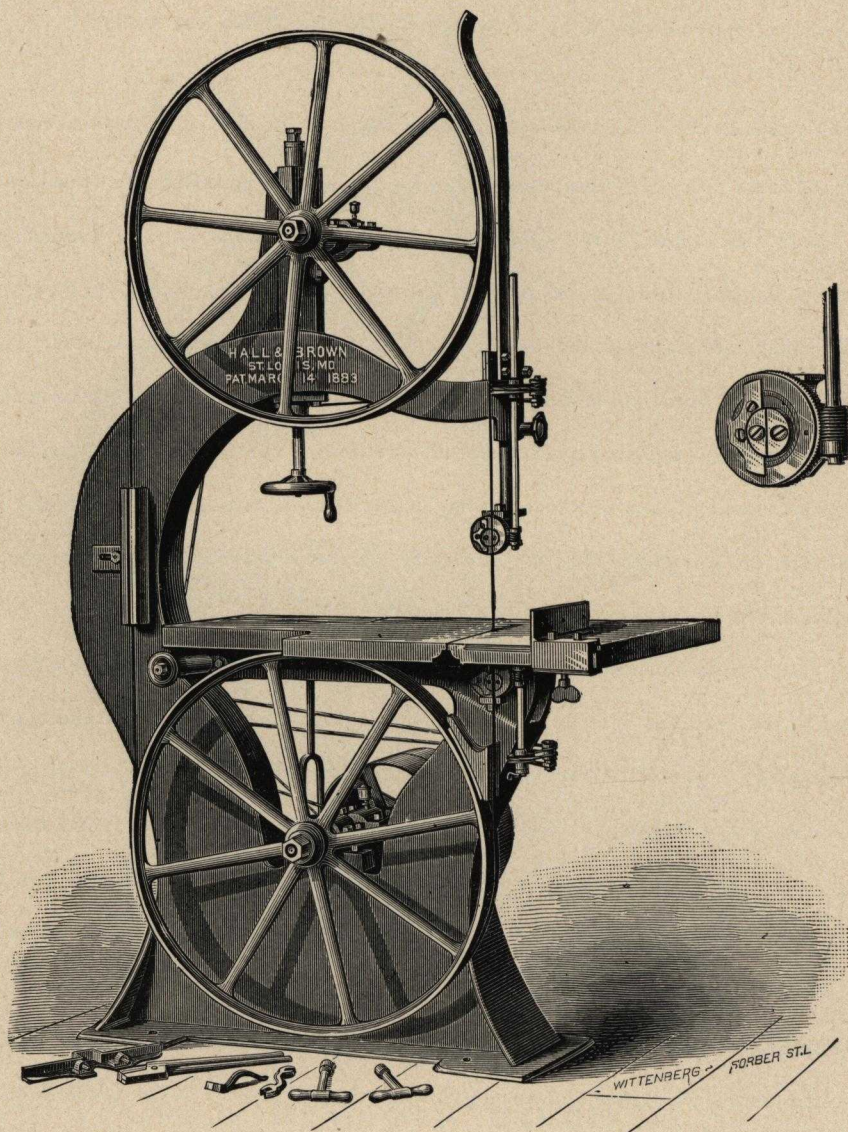
No. 1. Band Saw Machine.

Will Cut Stock 12 Inches Thick Between Guide and Table.

The Machine illustrated on opposite page has been designed with special reference to the demand for a good, well designed thoroughly built Machine which can be sold at a low figure, and is well adapted to the lighter grades of work, such as is found in Carpenter, Cabinet, Pattern, Toy and Job Shops, and all other ordinary work. Its adaptability of design, quality of workmanship and material, and capacity for hard work has been duly considered. The frame is one solid casting, cored out hollow (and not open at the back), made in this manner the frame is stiff and substantial, avoiding all trouble while in motion. The device for adjusting the bottom wheel shaft to cause the saw to run accurately in any desired position, on the wheel's face, is excellent, also the free access the operator has to all the screws appertaining to the bottom shaft boxes. The shafts are all made of the best quality of steel, also the vertical guide bar, which is planed square instead of being round, and can be moved up or down and fastened at any point by the operator, without the annoyance of twisting the guide round and throwing it out of line with the saw. The steel plate at back of guide gives the saw a full bearing and support, the plate being reversible. The slide guides are adjustable to the width and thickness of the saw. The guide raises and lowers with guide bar to adjust itself to thick and thin lumber, and will take in $13\frac{1}{2}$ inches under guide. The table is made of alternate strips of hard wood, glued up to prevent warping or springing and bolted to a heavy segment bar (or bracket) planed true and arranged so as to tilt at any angle. The wheels are of iron, made light and strong and covered with pure rubber and perfectly balanced. The tension of the saw is regulated by the upper wheel which is hung to a gibbed frame and adjusted by a hand wheel. The expansion and contraction of the saw is provided for by a rubber spring.

Each Machine is provided with Brazing Vice and Tongs, and one Saw Blade and the necessary wrenches. Each and every Machine is started and run on actual work before shipping.

Tight and Loose Pulleys are 10 inches in diameter, and $4\frac{1}{2}$ inch face, and should make 500 revolutions per minute.



No. 2. PATENT BAND SAWING MACHINE.

36 Inch Wheel. Weight, 1550 Pounds.

Length Blade required, 19 feet 4 inches; $1\frac{1}{2}$ inch wide or less.

NO. 2. PATENT BAND SAWING MACHINE.

Will cut stock 12 inches thick, between guide and table.

The illustration here represents our improved Band Sawing Machine, with McChesney's Patent Guide, of which we are the exclusive owners. There is probably no wood cutting machine which has come into use more rapidly than this machine. No wood working establishment can afford to be without one. This machine is heavy enough for all ordinary classes of work. It is built with the greatest care and of the best material, and with all the improvements which experience could suggest; the frame is cast in one piece and hollow, and of great strength. The table is of iron and adjustable for bevel work. The wheels are 36 inches in diameter, covered with rubber, giving them elasticity and cohesion to the saw. The wheel shafts are pivoted so as to adjust the wheels and run the saw accurately in any desired position on the wheel's face.

We will call your attention to the Patent Friction Guide, to receive the back thrust of the saw blade, thereby overcoming one of the most serious defects in a band sawing machine, viz; the breakage of the saw blades. By examining the Guide it will be observed that the line of travel of the Saw is at one side of the axis of the back plate, and that this line bisects the axis of the jaws and is a chord upon the circle formed by the back plate, with the saw in operation and the back plate revolving. The effect of this arrangement is to continually shift the center from which the lines radiate; hence the radiating lines will cross each other, and not only effectually prevent the saw from grooving the plate, but on the contrary maintain the surface of the plate even and smooth, as it is gradually and necessarily worn away by the friction of the saw; and furthermore the back edge of the saw is prevented from an uneven wear, which it would have, if the plate became grooved or uneven on its operative face.

The advantages of this invention may be understood when it is remembered that with a stationary back plate, or with one revolving at intervals, the saw becomes case hardened or crystallized on its back edge by reason of its frictional heat, and in consequence its durability is seriously affected, and furthermore the grooves worn in the back plate cause the saw to twist and prevents its effective operation.

The vertical guide-bar is square and can be moved up or down, and fastened at any desired point by the operator without the annoyance of twisting the guide round and throwing it out of line with the saw.

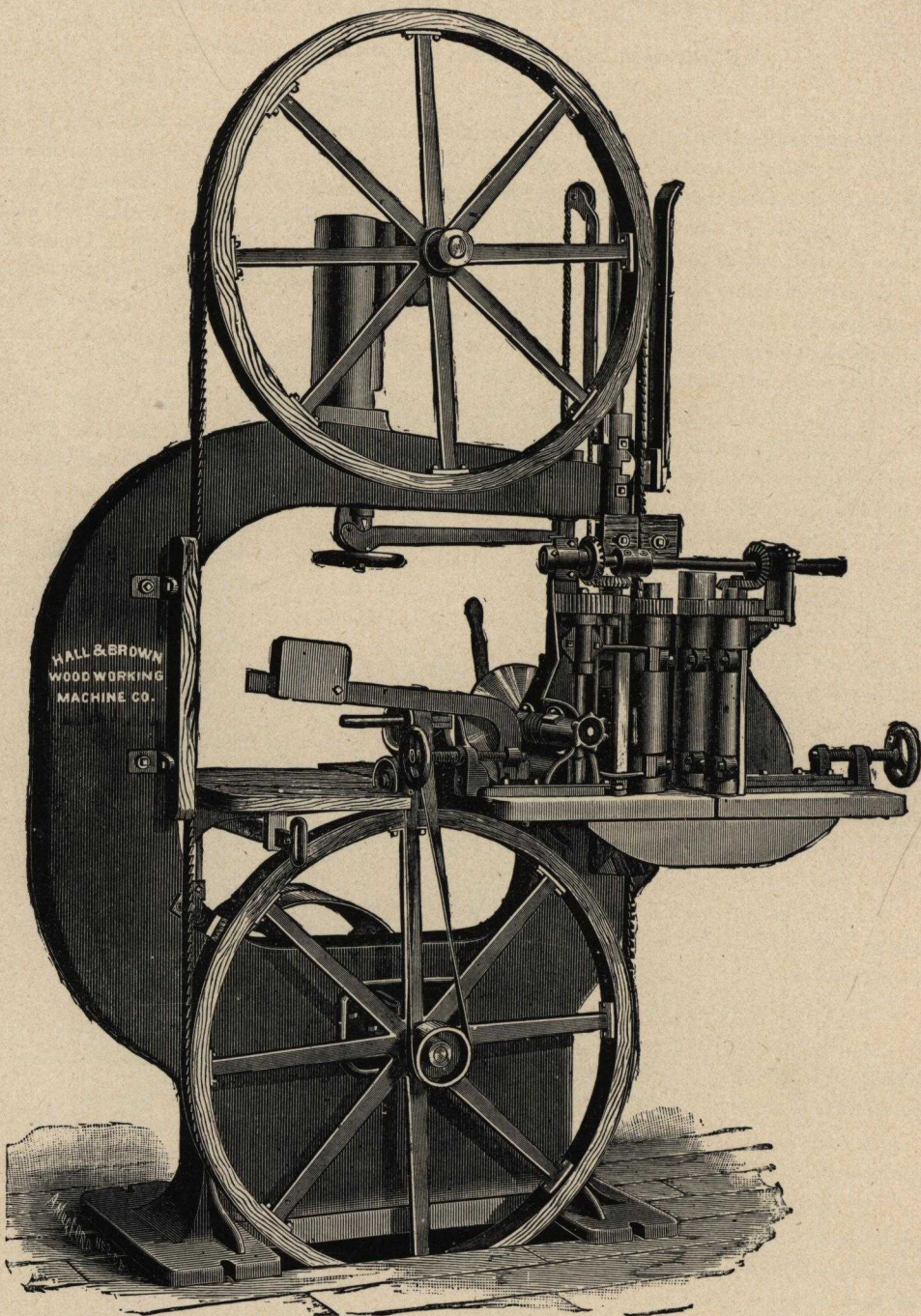
We would also call your attention to the simplicity of the adjustments of the table.

Another superiority we claim is the excellent device for adjusting the bottom wheel shaft to cause the saw to run accurately in any desired position on the wheel face, also the free access the operator has to all the screws appertaining to the bottom shaft-boxes.

It is also self-adjusting, and can be run at a high rate of speed, requiring no braces or bolts to bolt it down.

It is also provided with adjustable side pieces. The tension of the saw is regulated by the upper wheel, which is hung to a gibed frame, and adjusted by a hand wheel. The expansion and contraction of the saw is provided for by a rubber spring. Each machine is provided with brazing vise and tongues, and one saw blade; we always furnish extras when desired.

Tight and loose Pulleys, 12 inches in diameter and $4\frac{1}{2}$ inches face, and should make 400 revolutions per minute.



COMBINED SCROLL AND RE-SAWING MACHINE.

42-Inch Wheel.

Weight, 2600 lbs.

Length of Blade Required, 23 Feet Long, 2 Inches Wide or Less.

Combined Scroll and Re-Sawing Machine.

Will saw 20 inches wide and take in $7\frac{1}{2}$ inches or less, between rolls.

This machine is designed for those shops where there is some re-sawing and considerable scroll sawing, but where, for want of sufficient room or work, the use of a large special re-saw would not be advisable. It is carefully designed, heavy and powerful, having cored frame cast in one piece, extra heavy steel shafts, long bearings and large pulleys.

The Wheels are $2\frac{1}{2}$ inches face, with seasoned wood rims glued up in segments. They are covered with rubber, ground true and perfectly balanced.

The Main Guide has a hardened steel back-roller and the lower guide has a self-adjusting back plate.

The Re-sawing attachment consists of six rolls, four of which are geared together, the two smaller ones next the saw acting as guides. The rolls are strongly driven by a friction wheel and disk, by means of which the speed may be instantly varied from 5 to 18 running feet per minute, or stopped altogether by a convenient hand lever. All the parts of the feed works including the driving belt are immediately within the operator's reach.

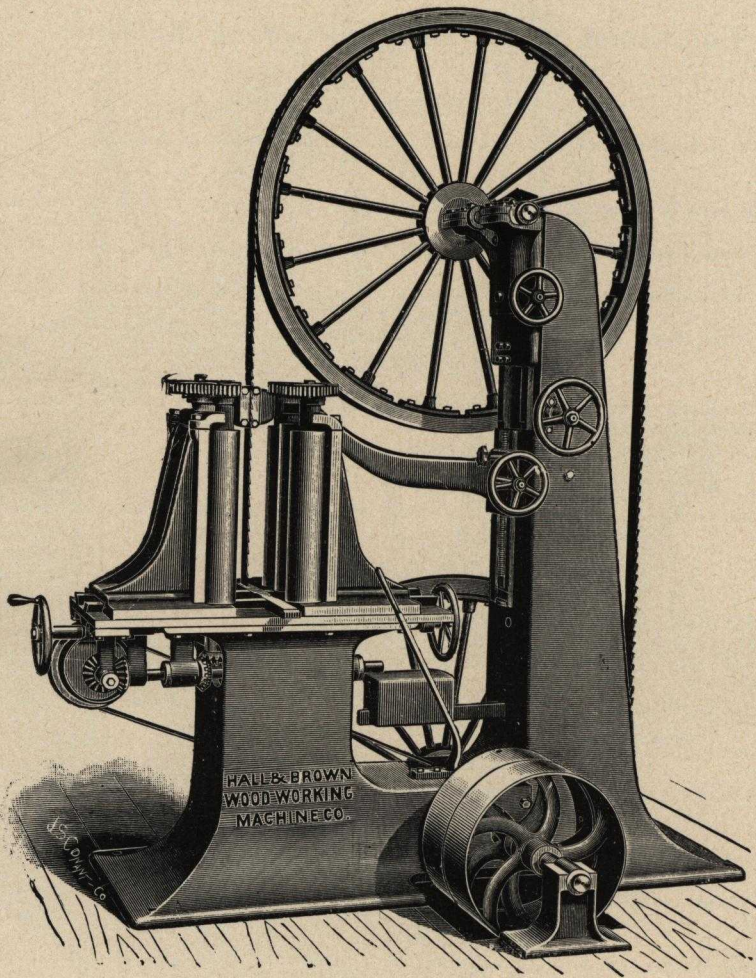
The table is of iron and is trussed underneath so as not to spring by the pressure on lumber, and it can be tilted to cut weather boards, etc.

The Feed Works take lumber to 20 inches wide (or deep) and 4 inches thick, so as to cut at the center or any point out of the center and they will cut to the center of $7\frac{1}{2}$ inches. Two panels, each $\frac{3}{4}$ inch thick when planed on both sides, can usually be got out for the average of 1 inch stuff, or 5 pieces plump $\frac{1}{2}$ inch thick not planed.

There is a third bearing outside the driving pulleys and a floor stand for the same.

One 2-inch and one $\frac{1}{2}$ -inch blade ready for use is furnished with each Machine.

The Tight and Loose Pulleys are 20 inches in diameter, and 6 inch face and should make 400 revolutions per minute.



No. 1. RE-SAWING BAND SAW MACHINE.

54-Inch Wheel, Weight, 3500 lbs.

Length of Blade Required 26 feet, 5 inches Long, 4 Inches Wide or Less.

No. 1. Re-sawing Band Saw Machine.

Will Saw 24 Inches Wide, and takes in 10 Inches or less between Rolls.

This Machine is designed for general Re-sawing in hard or soft wood and is especially adapted to the cutting of stock for panels and boxes in which thin material is required of considerable width. Special attention has been given to the rigidity of the frame in its construction, thus providing a solid support for the table and preventing any springing of the rolls and consequent imperfect alignment with the saw.

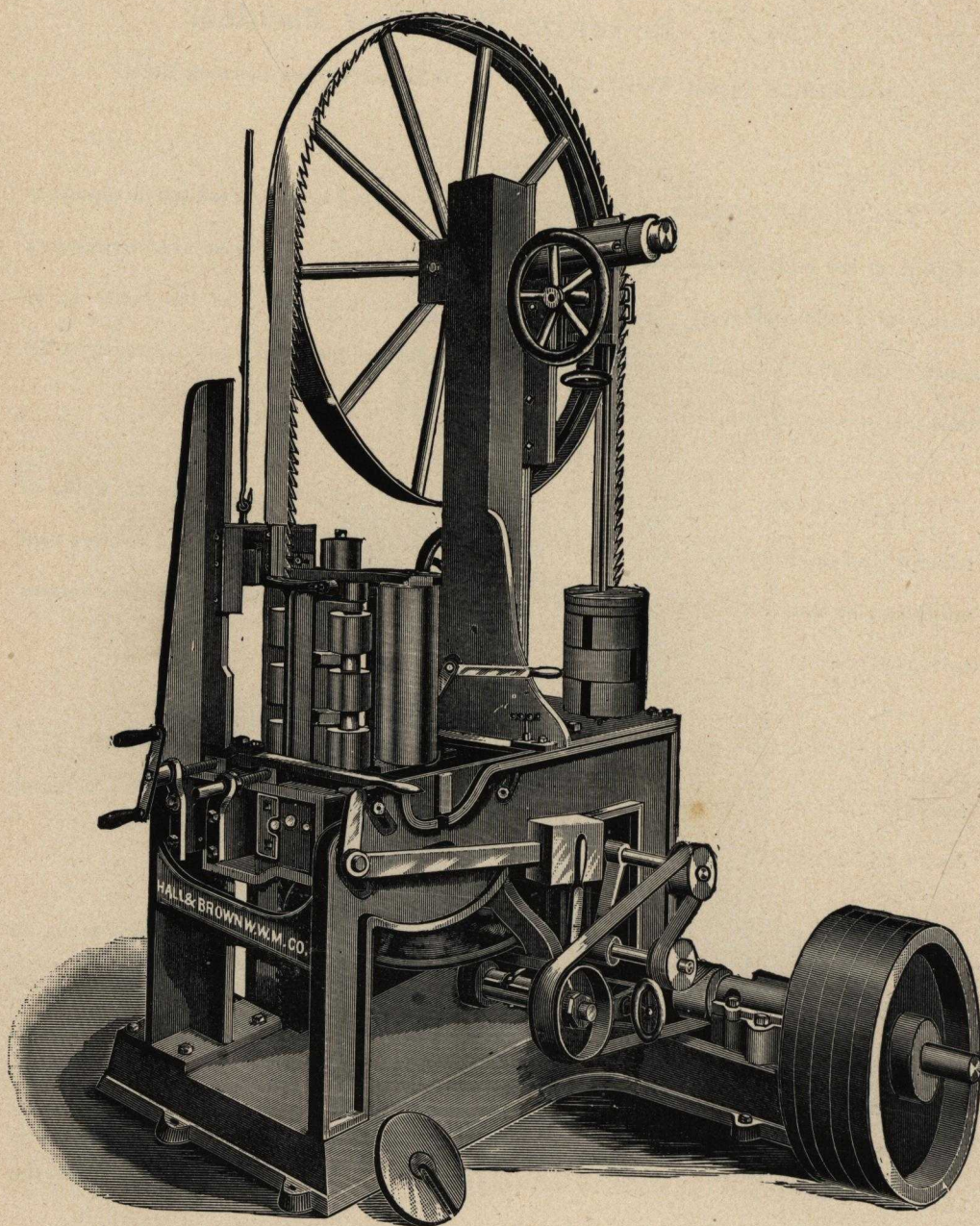
The wheels are made of iron and steel except the rims which are made of wood, of selected and carefully dried stock. The Machine is provided with a strong and positive feed which can be instantly started or stopped by means of a hand lever placed in front convenient to the operator.

The belt shifter and wheels for all the adjustments are on the front of the Machine and the expansion or contraction of the saw is automatically provided for by a simple and novel device which secures a uniform tension under all conditions.

The feed rolls are adjusted so as to be perfectly self-centering and are driven by an improved feed Pulley with gear connection, thus securing a strong and positive feed. Every Machine is fitted with an improved disc guide by which ample bearing surface is obtained with minimum friction.

The guide is held in position by a special arm with rack and pinion adjustment for any thickness of stock. One three inch blade ready for use is furnished with each Machine.

The Tight and Loose Pulleys are 24 inch in diameter and 6 inch face and should make 500 revolutions per minute.



No. 2. RE-SAWING BAND SAW MACHINE.

54-Inch Wheel, Weight, 5,000 lbs.

Length of Blade Required 27 feet long, 5 inches wide or less.

No. 2. Re-Sawing Band Saw Machine.

Will saw 24 inches wide and takes in 6 inches or less between rolls. This Re-sawing Machine is somewhat different in construction from the one illustrated and described on the two preceding pages; its principle feature being the construction of the wheels, they being of iron, and the manner of straining the saw and the feeding device.

The Machine is heavy and well constructed in all its parts; it is provided with sectional rolls which allows two or more strips of unequal thickness to be fed through at one time which are firmly held to a solid roll ensuring as good work as if you were feeding one narrow board.

They can be set either bevel or straight in an instant, making it desirable for re-sawing strips for bevel siding. The rolls are placed close to the saw allowing crooked lumber to be fed through without binding the saw blade or making it run out of the true line.

The manner of separating the rolls is such that it is impossible for them to bind, and an even pressure is always secured on the lumber being worked.

The Machine is provided with a self-centering device which may be used when desired on one side or set of rolls may be held rigid.

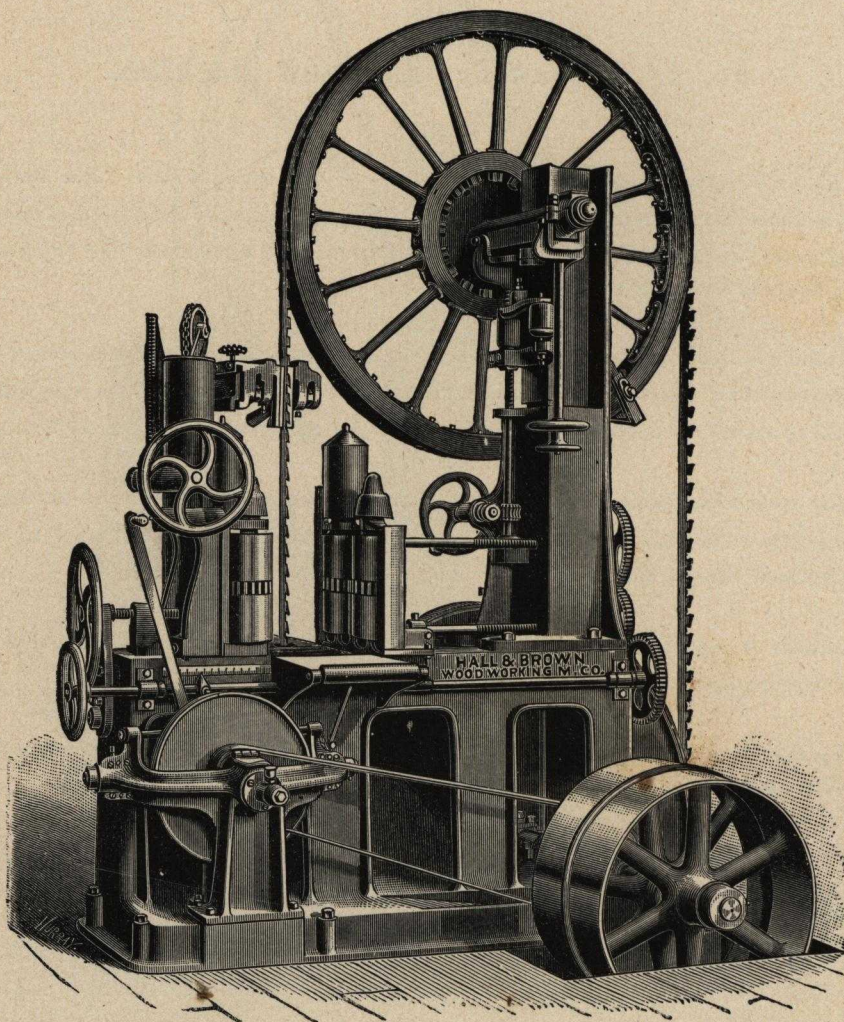
The feed works are simple and substantial in their construction and convenient for the operator.

The manner of straining the saw is accomplished by means of a weight together with a supplemental cushion thereby obtaining an even strain on the blade. Saw Blades can be used from 17 to 19 gauge if desired, and the rate of feed can be varied from 25 to 75 lineal feet per minute.

One 3-inch blade ready for use is furnished with each Machine.

The Driving Pulley is 22 inches in diameter and 7-inch face, and should make 525 revolutions per minute.

When counter shaft is ordered unless otherwise advised, it will be furnished with Tight and Loose Pulleys 18 inches diameter, and 8 inch face, and 20 inch Driver, which should make 575 revolutions per minute.



NEW RE-SAWING BAND SAW MACHINE.

No. 3 Re-Sawing Band Saw Machine, 66-inch Wheel. Weight, 6000 lbs.

Length of Blade Required, 30 feet. 6 Inches Wide or Less.

No. 3. Re-Sawing Band Saw Machine.

Will saw 30 Inches wide and takes in 21 inches or less between rolls.

This Machine is adapted to the heaviest class of re-splitting, opening 21 inches between the rolls, and will split 12 inches on one side of the Saw and 9 inches on the other.

The feeding is effected by four strongly geared live rolls, while two smaller idle rolls guide the last end of the stock up to the finish of the cut.

Strong spindles hold the rolls upon one side up to their work, and enables them to yield to all in equalities of thickness or shape, while the rolls upon the other side form a guide in perfect line with the saw, thus insuring a cut parallel with one side of the stock.

A friction device, controlled by a single lever, enables the feed to be instantly stopped and started, or to be run at any speed desired without changing belts.

With machines employing step pulleys or gears for changing the feed, one speed may be just a little too much and the next one not near enough, resulting in decreased output.

The saw runs between hardened steel plates filled with dog-wood plugs, with the end grain in contact with the saw, and each plate can be accurately adjusted by a single screw.

The back of the saw has a bearing $1\frac{1}{2}$ inches long on the beveled edge of a conical roller of a special composition, harder than steel. What little wear does occur takes place across the full width of the beveled surface, and therefore does not form grooves, as would be the case with a plain roller.

The upper guide is counter-balanced and is adjustable, vertically, by a hand-wheel. This hand-wheel, the lever for controlling the feed, the hand-wheel for setting the feed rolls, and the scale showing to what thickness they are set, are all accessible from the sawyer's working position.

The upper wheel has a rim of bent ash with steel spokes, and the lower one is a heavy iron casting. The lower wheel being thus much the heavier acts as a fly wheel to prevent sudden and violent fluctuations of speed, as in starting and stopping, and thus prevents the over running of the upper wheel, which, being lighter, is capable of following the motion of the lower one without causing the saw to slip or to become slack on the working side.

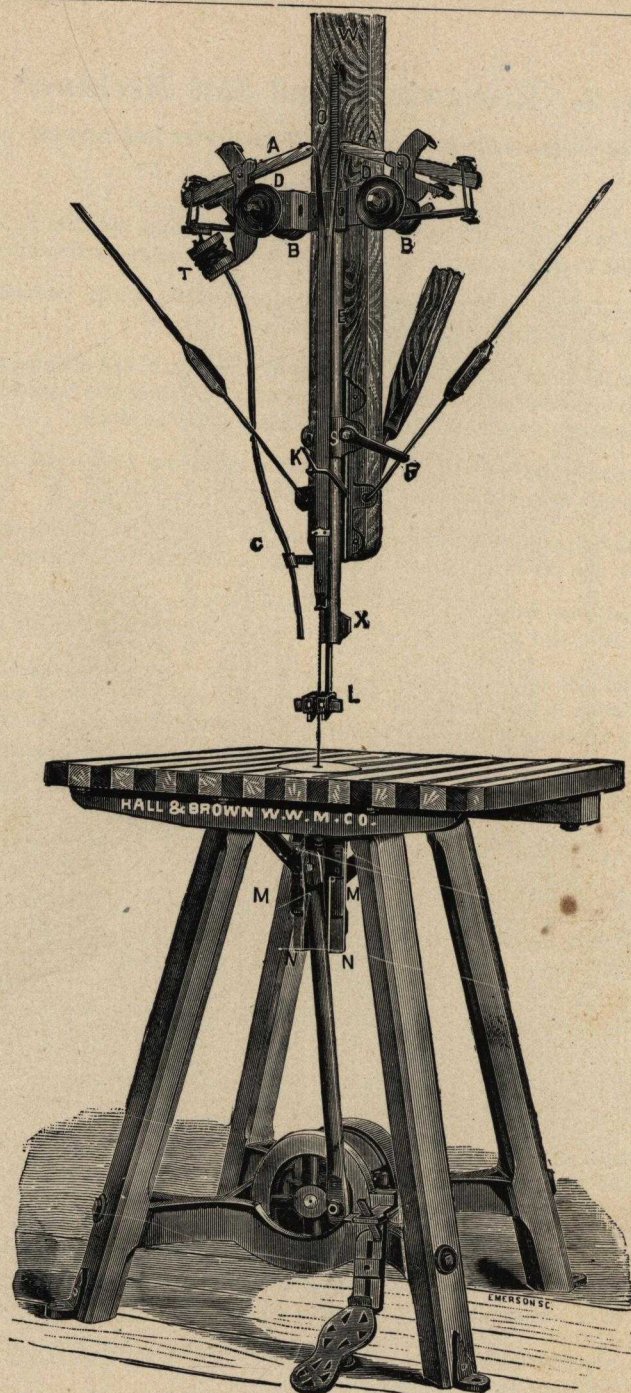
The rims of both wheels overhang the ends of the bearings, which latter are self-oiling. The overhanging feature effects the same result that some makers attain by the use of a clumsy and complicated arrangement of outside bearings.

The upper shaft can be angled while in motion. An adjustable spring maintains a proper tension on the saw, and renders it much more secure against breakage than the weights commonly used for this purpose, as the inertia of weights prevents them from yielding quickly enough when a chip gets between the saw and the wheel, the result being a broken saw. To provide doubly against such an accident, a wooden block is fitted in the throat between the saw and wheel so as to catch all chips and saw-dust and discharge them beyond the rim. The lower wheel is kept free from accumulation of saw-dust by a scraper, and the upper one by a brush.

The body is a box-shaped casting, in one piece, very strong and rigid, and it can be placed on any good floor without a special foundation.

The loose pulley is self-oiling, one inch smaller in diameter than the tight pulley, to slacken the belt when the machine is stopped, and it is provided with a step at the inner edge to cause the belt to shift easily.

The Tight and Loose Pulleys are from 22 to 30 inches in diameter as ordered and 8 inch face and should make from 450 to 500 revolutions per minute.

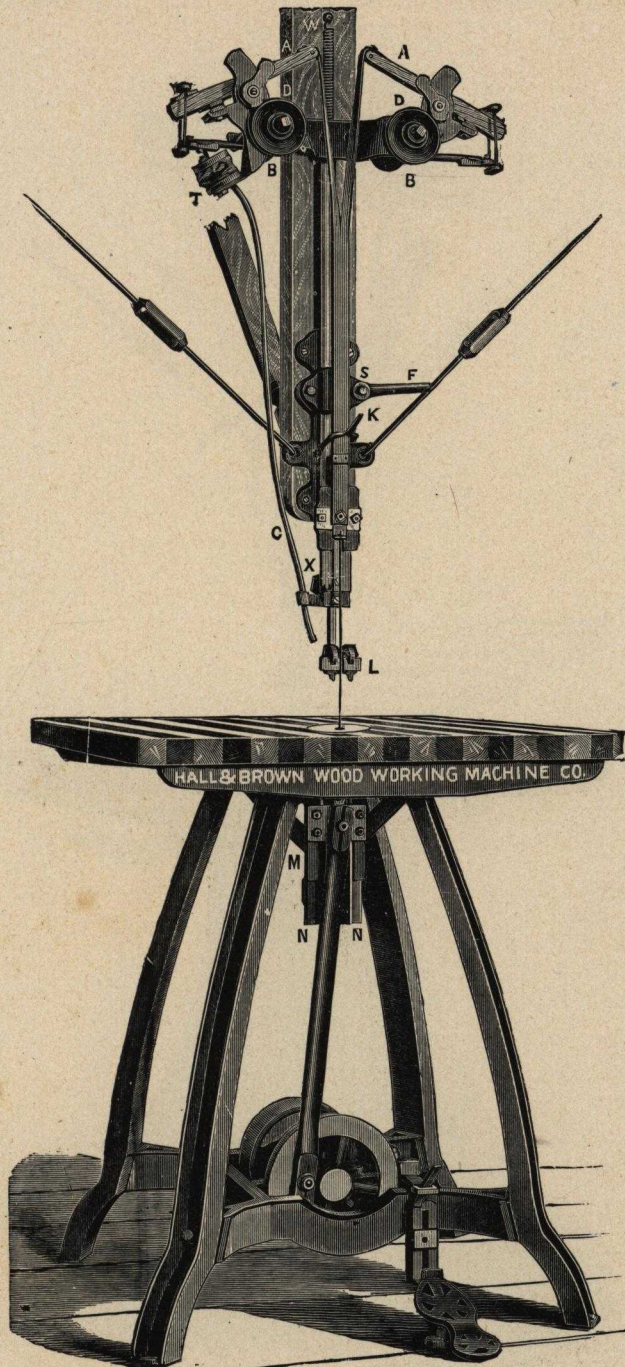


No. 1. SCROLL SAWING MACHINE.

Weight, 450 lbs.

This Machine is the same in construction as the No. 2 on opposite page with one exception the four uprights in lower frame are made of hard maple 3 inches square, the working parts throughout being the same. No Tight and Loose Pulleys are required, it is driven by one Pulley operated by friction, operated by the foot, and can be started or stopped instantly.

The Friction Driving Pulley is 8 inches in diameter and 3 inch face, and should make 825 to 850 revolutions per minute.

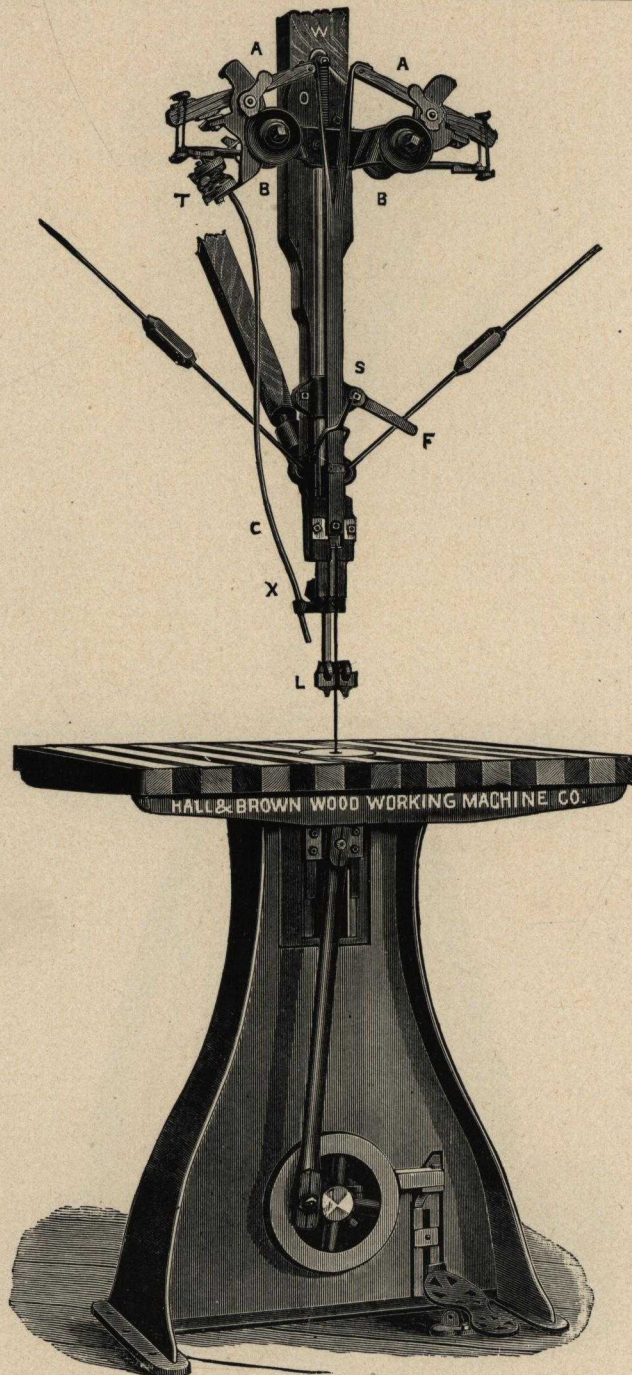


No. 2. SCROLL SAWING MACHINE.

Weight, 500 lbs.

This Machine is similar to the No. 1 on opposite page, the only difference being in the four upright legs. It is provided with the friction Pulley and combination break for starting and stopping the Machine instantly. The upper rigging including the straining device, Air Pump, Guide, Ways, Cross Head, Steel Bearings, with all other connections are free to move up or down to suit any length of saws. The table is 36x38 inches.

Friction Driving Pulley is 8 inches in diameter and 3 inch face and should make 825 to 850 revolutions per minute.

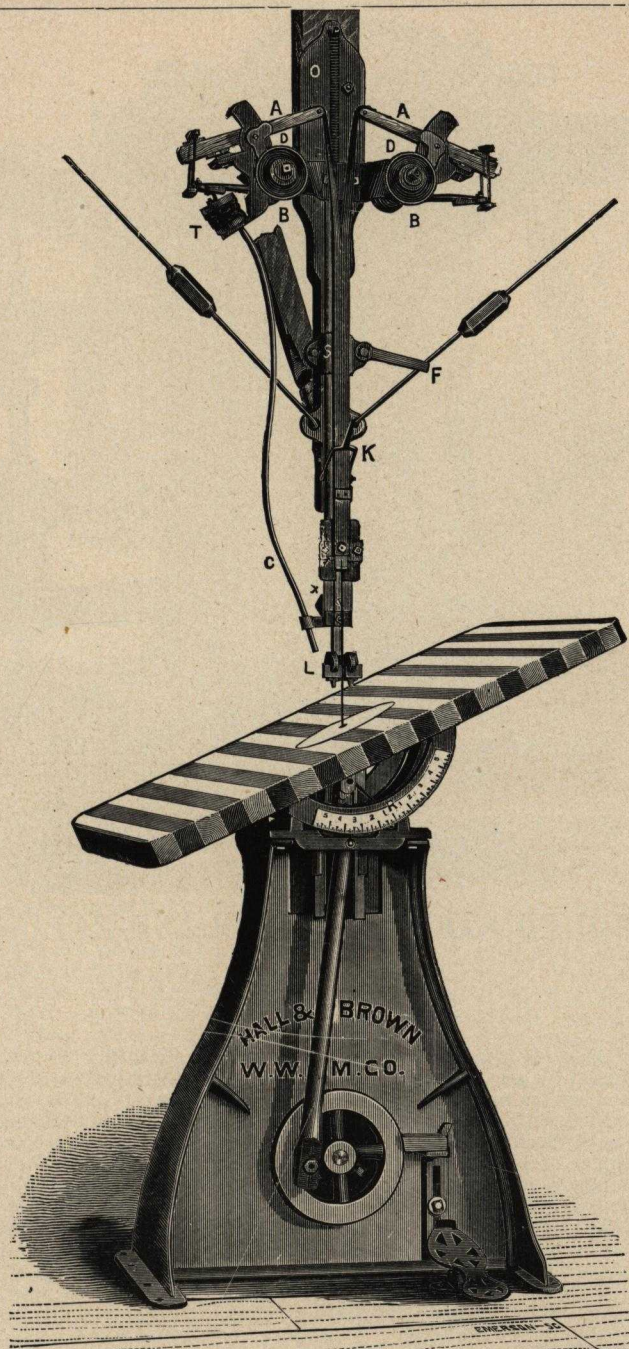


No. 3. SCROLL SAW MACHINE.

Weight, 500 lbs.

This Machine has the same frame and is a duplicate in construction of the No. 4 on opposite page, except that the bed or table is stationary. It is provided with a friction pulley and combination break instead of the ordinary Tight and Loose Pulley, whereby the Machine can be stopped instantly by a single movement of the foot without shifting the belt and saves one half the time in changing the saws on inside work. The Machine can be stopped when running at full speed and saws changed inside of four seconds. Size of table top 38x40 inches. We furnish one dozen assorted saw blades with each of our Machines.

Friction Pulley, 8 inches in diameter and 3 inch face and should make 825 to 850 revolutions per minute.

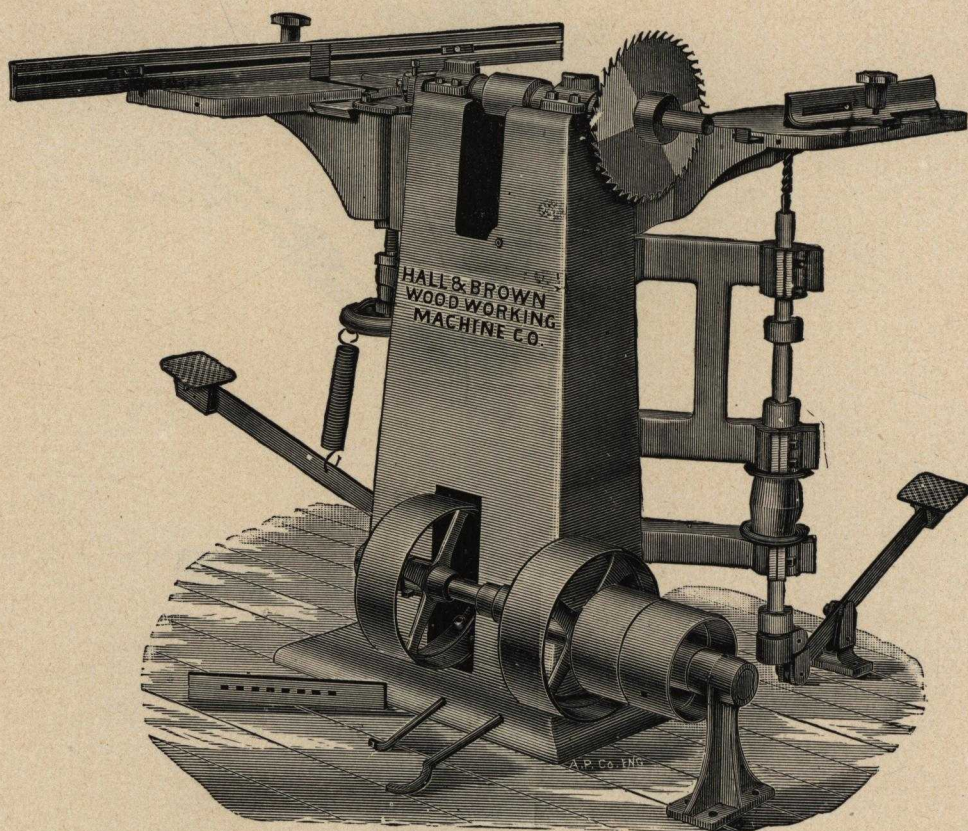


NO. 4. SCROLL SAWING MACHINE.

Weight, 500 lbs.

This Machine is the same in construction as the No. 3 on opposite page, except that it has a tilting table. This table can be set in a moment at any desired angle either to the right or to the left up to thirty-nine degrees and is securely held in place by an eccentric lever. The circle upon which the table works is ruled both to the right and the left to indicate the exact bevel required. By this arrangement the table when used on an incline can be brought back to a dead level in a moment. One dozen assorted sized blades are furnished with each Machine.

Friction driving Pulley is eight inches in diameter and three inches face, and should make 825 to 850 revolutions per minute.



IMPROVED SASH MORTISER AND RELISHER.

Weight, 600 lbs.

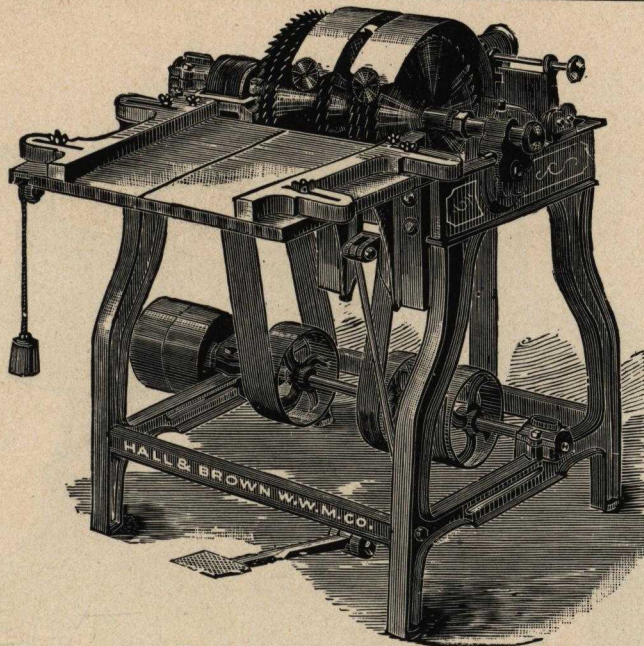
The above machine is intended for mortising the rails, in sash; for receiving the bars. The work is performed by an Auger Bit running on the inside of a hollow chisel. This machine completes a square mortise and cleans out the chips at one operation with the foot Treadle. It is provided with stops for regulating the different lengths of the Mortise, also for spacing the distance of the Mortise from the shoulder of the Tenon. It has adjustments for raising and lowering the table for the mortising of different thicknesses of stock. We wish to call special attention to the Relishing attachment on this machine, as the Relish is completed on the opposite side from where the mortise is done. This machine can be operated by two boys, each doing different work at the same time, without interfering with the other. This is an improvement over all other machines of a similar kind, where the boring has to be done on the one side and then taken over to the other side of the machine to rip off the Relish. This improvement will be appreciated by all practical Mill men over the old way, as it saves fully half the time. It also leaves a relish with a square, clean cut and no corners torn out or split off, as will on any ordinary cutter head. We guarantee this machine to give the best of satisfaction, and will send one to any responsible party in the United States on thirty days trial. We furnish with this machine, when sold as a Mortiser and Relisher combined, one $\frac{1}{2}$ inch by $\frac{7}{16}$ chisel and one auger bit, also one auger bit $\frac{3}{8}$ and one rip saw ten inches diameter, to be used on the Relishing side of the machine.

Tight and Loose Pulleys 6 inches in diameter, 3 inch face, and should run 850 revolutions per minute.

BELTS WHEN ORDERED.

Driving belt three inches wide, in length to suit from line shaft.

Two belts two and one-half inches wide, in length to suit from counter shaft.



COMBINED DOOR RELISHER AND WEDGE CUTTER.

Weight, 550 lbs.

The accompanying cut is a fair representation of a new and improved Combined Relishing and Wedge Cutting Machine for relishing the rails of sash, doors and blinds, and converting all waste timber into wedges (for wedging up doors, etc.) in the most perfect manner. This machine is made of iron and steel with a hard wood table, and nothing has been neglected that could in any way add to its convenience, efficacy and durability. It is very simple, easily understood, and its capacity is only limited by the activity of the operator. It will do all the work in the largest factory in the most perfect manner. Parties in need of such a machine will do well to send for samples of its work.

It consists of a substantial iron frame upon which is mounted an arbor carrying nine saws, five of which are graded from 12 inches to 14 inches, the largest being to left; the balance (four saws) are placed at the right, all arranged in groups, as shown in cut, and are adjustable by means of rings placed on arbor between the saws. The left hand table is bolted firmly to the frame, and is provided with a dovetail slide, to which is attached the guide which brings it back when released: this guide should be set at right angles with the cutting edge of the graded saws). The right hand table is gibbed to frame, and is raised by foot treadle. It is provided with guide and stop, which is placed in end of guard and carried along with it. The guide on left hand table is provided with stop in end, and one on under side of slide to arrest its forward movement and govern depth of cut of saws. The circular guards, (extending from the rear over and down in front, through which is journaled a small arbor that carries the small cut-off saws) are bolted to a yoke at the rear of large saws, and are adjustable right and left, and by taking out two small bolts the whole turns back clear of saws. The machine is made adjustable in all its parts. The small saws are held firmly to the work in front by the circular guards through which the arbors are journaled.

TO ADJUST THE MACHINE.

Lay out bottom rail with $1\frac{1}{2}$ inch relish on bottom and $2\frac{1}{4}$ inch in center of bottom and middle rails; place the rail on right hand table; adjust the guide so that the right hand group of (4) saws will cut the centre relish into three parallel strips and the middle group of (2) saws will cut the bottom relish into two strips; turn the rail over on to the left hand table; adjust the guide so that the left hand group of (3) saws will cut the strips into two pieces diagonally across from corner to corner, making two wedges each, and the center group of (2) saws will cut the bottom also. After the machine has been properly adjusted, place the rails on left hand table first, with work edge to guide, adjust the guide and stop so that all the saws will cut up to shoulder.

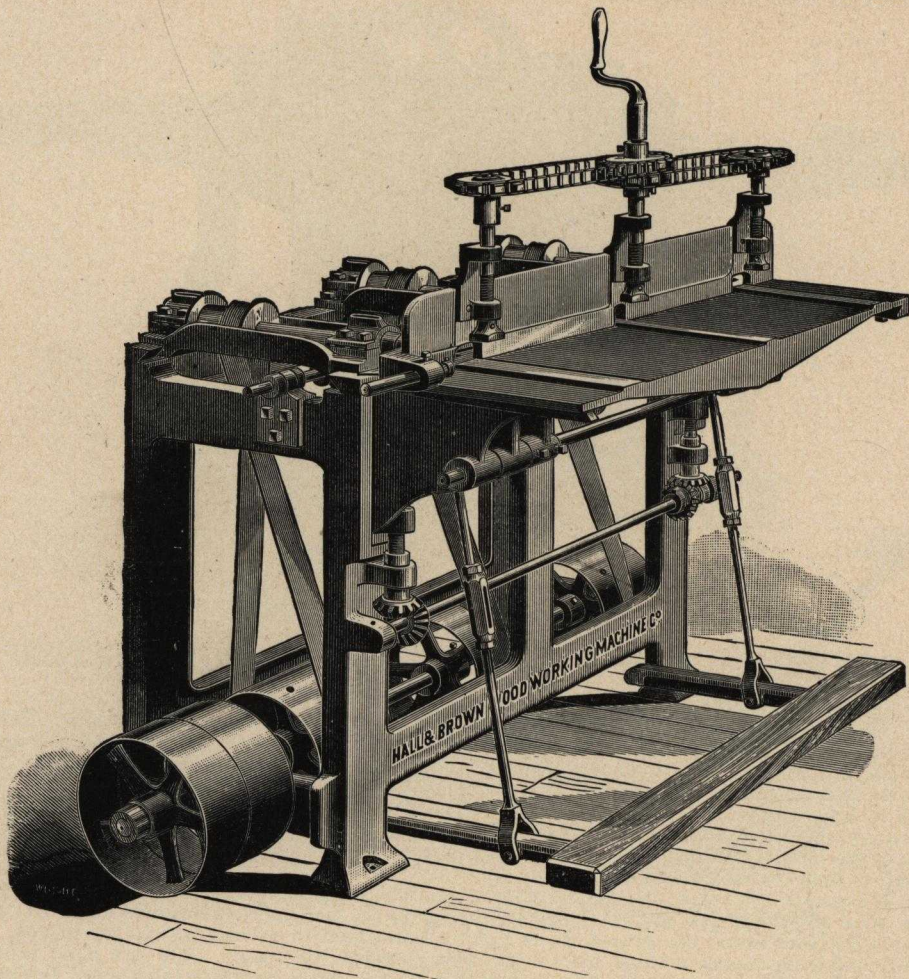
Tight and Loose Pulleys are 8 inches in diameter and 4 inch face and should make 800 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 4 inches wide, in length to suit from line shaft.

Two Mandrel Belts, 5 feet 10 inches long, each, 4 inches wide.

One Belt 5 feet 4 inches long, 2 inches wide.



No. 4. MULTIPLE BORING MACHINE.

Made with 3 or 4 Spindles as Ordered. Weight of 3 Spindles, 800 lbs. Weight of 4 Spindles, 850.

The above cut represents our new Multiple Spindle Boring Machine, designed for rapid and accurate work. It is specially suited for boring table leaf work, furniture work and agricultural work.

The frame is iron, well braced and planed up perfectly true. The mandrel frames slide on planed ways, and each mandrel is adjustable to and from the center mandrel by a hand wheel, and each mandrel is driven by an independent belt.

The table works on planed ways and is raised and lowered by bevel gears and screws operated by a crank and parallel shaft below. The treadle is connected to the table by adjustable rods to regulate the throw of the table, which is brought up to the boring bits when the treadle is brought down, and when the treadle is released the table returns to its original position.

The clamping device is entirely new, all the screws being operated by one crank handle in the center. One quarter of a turn on the handle gives $\frac{1}{4}$ -inch movement to the screws, clamping the stock down to the planed surface of the table, and in connection with the end stop it is impossible to bore holes out of line. For extension table work it surpasses anything on the market.

The machine can be made with one or more spindles; as a multiple borer it will bore from 4 inches to any required distance.

The Tight and Loose Pulleys are 10 inches by $5\frac{1}{2}$ inches, and should make 750 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, $4\frac{1}{2}$ inches wide, in length to suit from line shaft.
Three Belts, 6 feet 6 inches long, $2\frac{1}{2}$ inches wide.

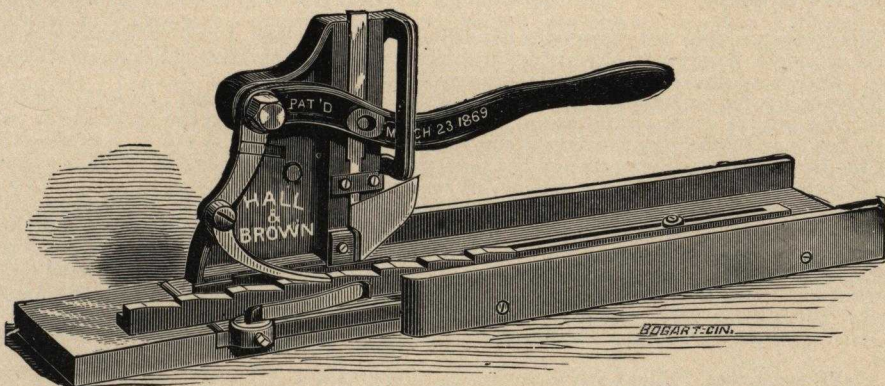


"H. & B." DOUBLE BLIND WIRING MACHINE.

Weight, 65 lbs.

Operated thus: The rod is put to place on the Table. The slat is held by hand under the upper or end Driver. The up stroke of the handle draws the rod forward and drives the staple into the slat. The slat is immediately changed to place on the rod, and the down stroke of the Handle drives the staple into the rod, making connection between the rod and slat at one full stroke of the Handle. The Machine is adjustable in all its parts. Drives the wire straight, or at angles with the slat. Drives long or short staples into wide or narrow slats, large or small rods. The Driver is large and strong, and is held firmly against the face plates by a steel Follower and Elliptic Spring, which entirely prevents the dropping of staples. All wearing parts case-hardened.

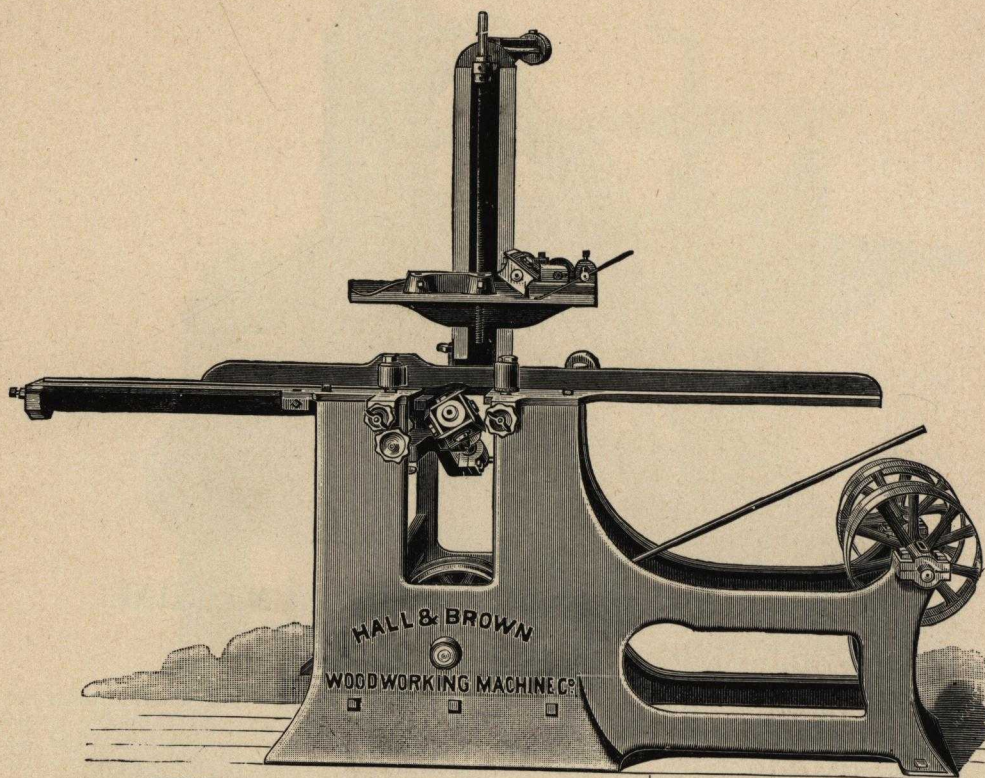
It will save more than half the cost of labor over any Machine in use. Every Machine fully warranted.



"H. & B." SINGLE BLIND WIRING MACHINE.

Weight, 50 lbs.

This is a very simple, strong, practical Single Wirer, carrying the same main Driver with all of its improvements that has rendered our Double Wirer so popular. It takes the place of the Double in shops of moderate capacity, and cannot fail to satisfy the most exacting requirements.



BLIND RABBETING AND JOINTING MACHINE.

Weight, 600 lbs.

The accompanying cut represents our Blind Rabbeting and Jointing Machine, which is the most complete, handy and economical machine for this work that has been offered to the market. Following are some of the advantages of this machine.

The blind is fed on its edge, doing away with a wide table, to admit of a wide blind being rabbeted; the bead is stuck on the same side with the guide, avoiding the unevenness usually found in beads on blinds; the headstock carrying the rabbeted head is set on a mitre with the face of the blind, which makes a free cut on both sides of the rabbet; the headstock is adjustable vertically and horizontally while in motion, by means of screws.

The table on this machine is long, and the after-part is adjustable in line with the cutters, which insures straight work. The blind is held firmly by means of springs, and is fed through by two rubbers rolls, one before and the other after the cutters. The first roll is fitted with a spur or fluted roll on the lower end, which operates on the part to be cut out, making a strong feed and much better work than can be done with the usual method of pushing the blind through by hand. The blind is jointed on both edges at the same time it is rabbeted and beaded.

With all these advantages, the low price of this machine especially recommends it to the market.

Tight and Loose Pulleys are 10 inches in diameter and 4 inches face and should make 550 revolutions per minute.

BELTS WHEN ORDERED.

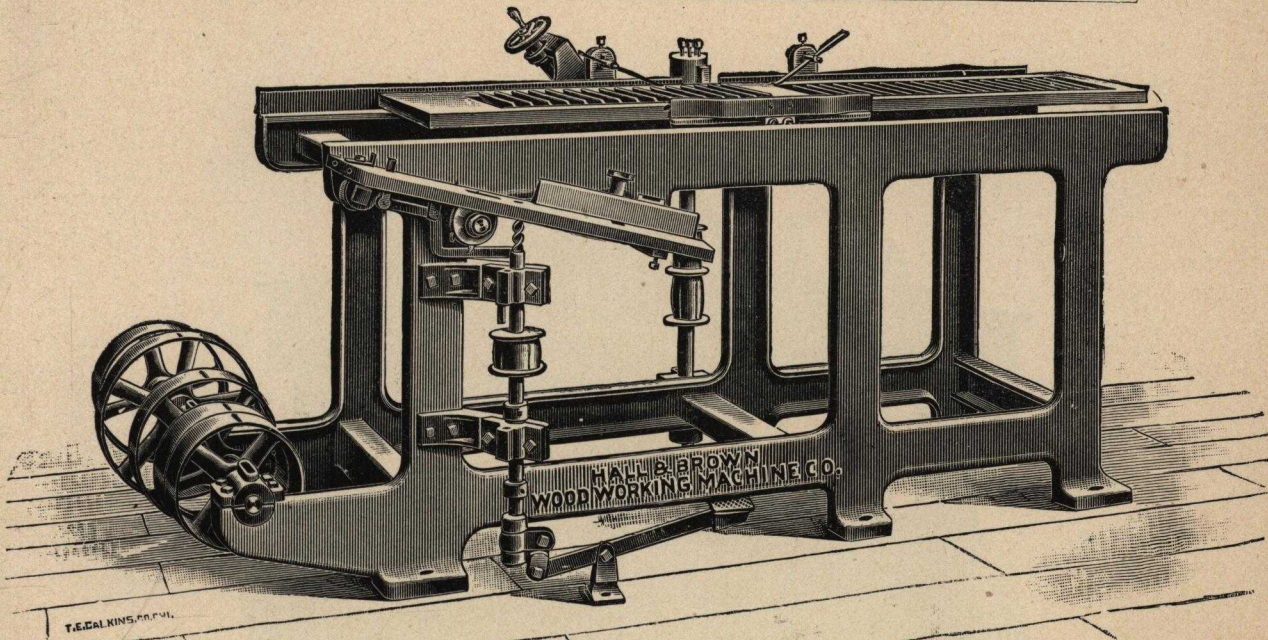
Driving Belt, 4 inches wide, in length to suit from line shaft.

One Belt, 9 feet 5 inches long, 3 inches wide.

One Belt, 11 feet 8 inches long, 2 inches wide.

One Belt, 9 feet 2 inches long, 1½ inches wide.

One Belt, 8 feet 5 inches long, 1½ inches wide.



NEW AND IMPROVED SASH AND BLIND RABBETING, JOINTING, BEADING AND BORING MACHINE.

Weight, 1100 lbs.

This machine is intended for Rabbeting, Jointing and Beading Blinds, and Plowing, Boring and Finishing Sash, which possesses a number of points of superiority over any other machine of the kind yet introduced, a few of which are as follows.

As shown in the above illustration, the frame is cast in one piece and is therefore, at all times, perfectly rigid and solid. For sash work the frame is fitted with the usual movable table, which, in this machine, is provided with stops for holding the sash in such a position as to insure a perfect uniformity of thickness in the meeting rails. The cutters in the jointing-head are set in such a way as to give a shear cut, which prevents all chipping of the ends of the tenons, and the work then passes to the sand disk, which gives it a perfectly smooth finish.

A special feature of the machine is the Ploughing and Boring Attachment, which is set on an incline. The sash being placed on the table, is moved forward over the grooving-head to a stop adjusted to the required distance of the hole from the end of the sash; then, by placing the foot on the treadle, the hole is bored to receive the knot in the cord, and the first stop drops below the table, giving the operator ample time to move the sash over it to the second stop, which completes the groove into the hole. This hole being bored at an angle with the groove gives a much firmer fastening for the cord.

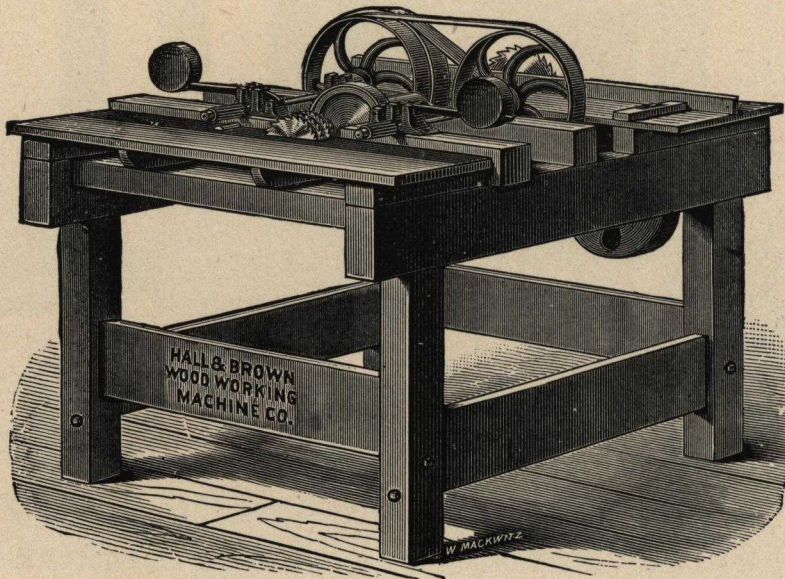
For finishing blinds, the sash table is removed and the work done on the stationary table. By simply removing the sand disk and substituting a small beading head, the arbor can be dropped down below the line of the table and with a slight lateral adjustment the machine is ready for Rabbeting, Jointing and Beading at one operation; the work being held in such a way as to insure a perfectly square and straight joint.

The method of belting this machine is another feature which deserves and will command special attention, as it is far superior to any other. The jointing head is driven by a long belt direct from the counter-shaft. From this mandrel a long open belt is carried to the boring attachment, thus avoiding entirely the crowding together of pulleys and short, troublesome belts found in other machines. The grooving and beading heads are driven direct from the counter-shaft.

Counter-shaft has Tight and Loose Pulleys, 10 inches in diameter, 4 inch face and should run 900 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt in length to suit from line shaft.
One Belt, 10 feet 1 inch long, 3 inches wide.
One Belt, 7 feet 8 inches long, 2 inches wide.
One Belt, 6 feet 3 inches long, 2 inches wide.
One Belt, 9 feet 10 inches long, 2 inches wide.



COMBINED LATH AND BOLTER MACHINE.

Weight, 700 lbs.

The above cut represents two Machines combined in one as a Bolter and Lath Saw which has been recently improved and is in extensive use, and as now perfected it is simple in construction and easy to operate. It is well adapted to the wants of those who desire a good combined Machine at a small cost.

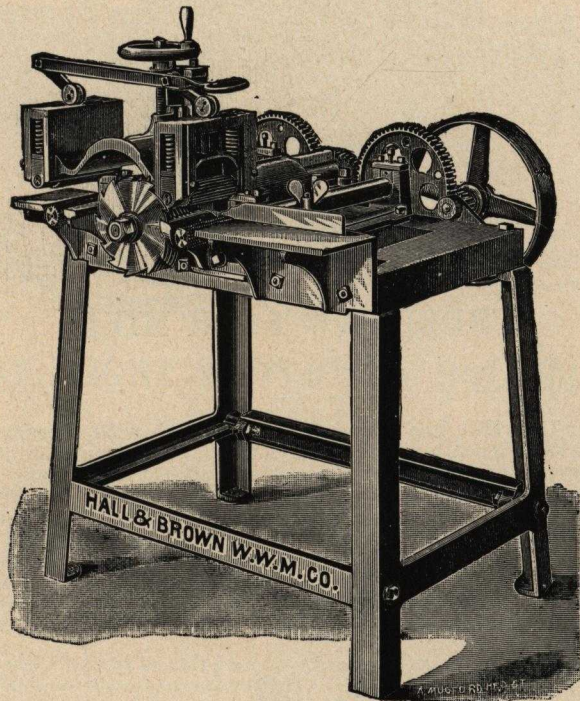
The Mandrel is made of steel and is $1\frac{1}{2}$ inches in diameter and belted in the center and arranged at one end to carry three 11-inch Lath Saws. The opposite end of the Mandrel carries one 16-inch Bolter Saw.

The feed shafts are of steel and the front rolls are driven by a friction pulley and the back rolls by a belt from a large friction pulley forming a substantial and positive feed which can be started and stopped at the will of the operator.

We furnish with each Machine balance wheel for Mandrel Feed Belts, three 11-inch Lath Saws and one 16-inch Bolter Saw.

The Pulley on the Saw Mandrel is 8 inches in diameter and 9 inch face and should make 2800 revolutions per minute.

When counter-shaft is ordered, unless otherwise advised it will be furnished with Tight and Loose Pulleys 12 inches in diameter and 8 inch face with 28 inch driver and should make 800 revolutions per minute.



No. 1. GANG LATH SAW MACHINE.

Weight, 600 lbs.

This Machine is built entirely of iron and steel, and is adapted for the rapid sawing of Lath, Pickets, Blind Slats, Chair or other work.

The Machine is furnished with six 7-inch Saws and will split timber 2 inches in width. Its capacity of laths is from 30,000 to 40,000 in 10 hours. We are prepared to furnish heavier Machines of similar design, viz: No. 2 which carries six 8-inch Saws and splits $2\frac{1}{2}$ inches wide, also No. 3 which carries six 9-inch Saws and splits 3 inches wide.

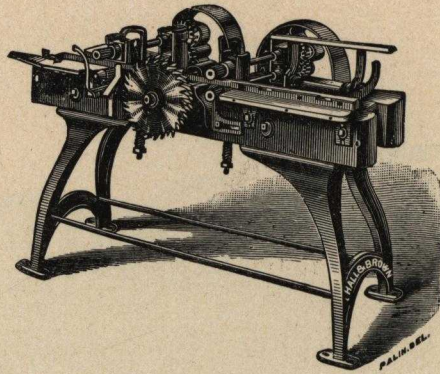
The Machine is self-adjusting and self-feeding, the feed can be started or stopped instantly by a hand lever for the purpose.

The slabs to be cut on the Machine is split the right width and thickness for lath or pickets and the Machine will cut about 90 laths per minute, or 5000 per hour, less in proportion to the width of the pieces.

We furnish the Machine complete except driving belt.

The Pulley on the Saw Mandrel is 6 inches in diameter and 8 inches face and should make 3500 revolutions per minute.

When counter-shaft is ordered unless otherwise advised it will be furnished with Tight and Loose Pulleys 10 inches in diameter and 6 inch face, with 24-inch driver and should make 900 revolutions per minute.



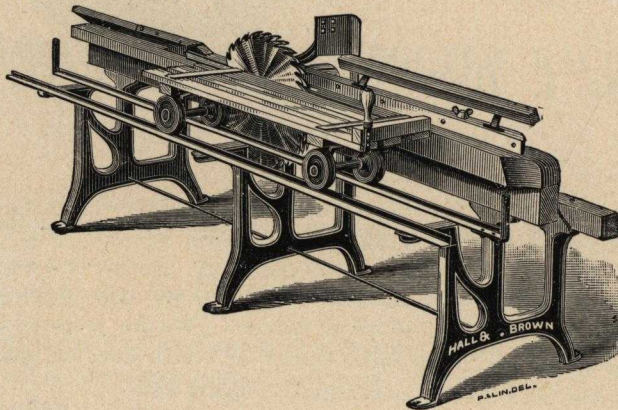
THREE SAW LATH MILL.

Weight, 400 lbs.

Our Three Saw Lath Mill has recently been improved with a positive feed, is a lighter machine than the six saw, is run by two belts, and will do the same amount of work in proportion as the six saw, sawing from twenty to thirty thousand lath in ten hours; the mill is mounted on an iron frame, and the back rolls of the six saw lath mill are done away with; but just back of the saws are placed two rolls which, by running at a high rate of speed, throw the lath away from the machine into a box or other receptacle. Only one man is required to run the mill.

Pulley on the Saw Mandrel, 8 inches in diameter and 6 inch face and with 18 inch saws should make 1800 revolutions per minute.

When Counter-shaft is ordered, unless otherwise advised, it will be furnished with Tight and Loose Pulleys, 12 inches in diameter, 8 inch face, with 24x8 Driver, and should make 600 revolutions per minute.



ONE OR TWO SAW LATH BOLTER.

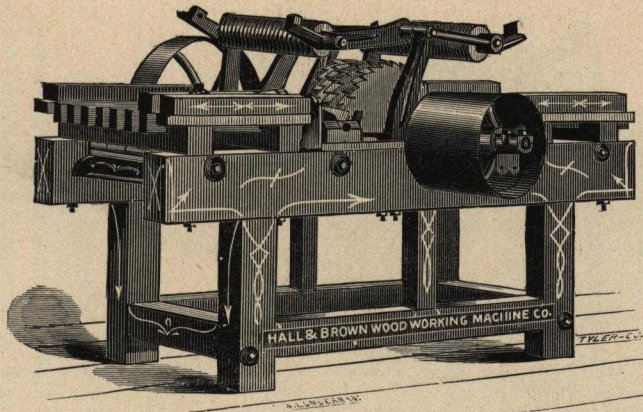
Weight, 500 lbs.

This Bolter has recently been improved and bolting capacity increased by the addition of another Saw, making it a Two Saw Bolter, and so arranged that the operator can cut one or two bolts at will. It requires but one man to work it, and the bolts are thrown off and out of the way of the operator on the opposite side from where he feeds the bolts in place for the lath mill.

Pulley on Mandrel, 8 inches in diameter and 8 inch face, and with 20 inch saws should make 1800 revolutions per minute.

When counter shaft is ordered unless otherwise advised it will be furnished with Tight and Loose Pulleys, 12 inches in diameter and 8 inch face and 24 inch Driver, and should make 600 revolutions per minute.

We are prepared to furnish lath or picket mills with any number of saws from 1 to 10 as ordered.



SIX, EIGHT OR TEN SAW BOLTER.

Weight, 800 lbs.

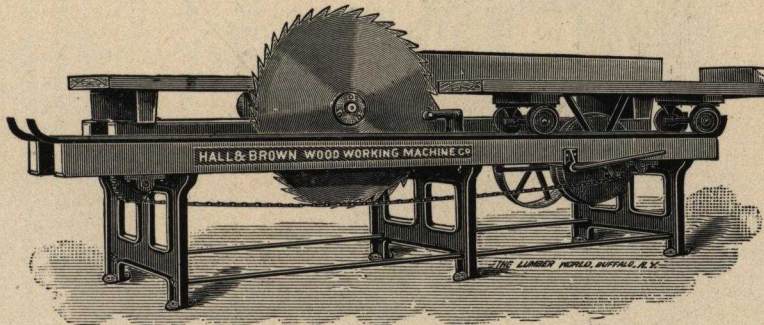
Our Gang Bolter is made heavy and strong; the machine part is built on a cast iron yoke which is bolted on a heavy wood frame.

It is self-feed, with a two and one-fourth inch arbor with three bearings, self-oiling boxes.

The lumber passes between four solid cast iron four inch grooved rolls, the two upper being hung on a pivot, directly over the arbor, and for sawing pickets, bed slats, etc., nothing can be better. The saws are 20 inch, ten gauge or smaller if desired. It has two feeds, slow and fast.

Pulley on the Saw Mandrel is 12 inches in diameter and 12 inch face and with 20 inch saws should make 1800 revolutions per minute.

When the counter shaft is ordered, unless otherwise advised it will be furnished with one 12x12 and one 30x12 Pulley, and should make 700 revolutions per minute.



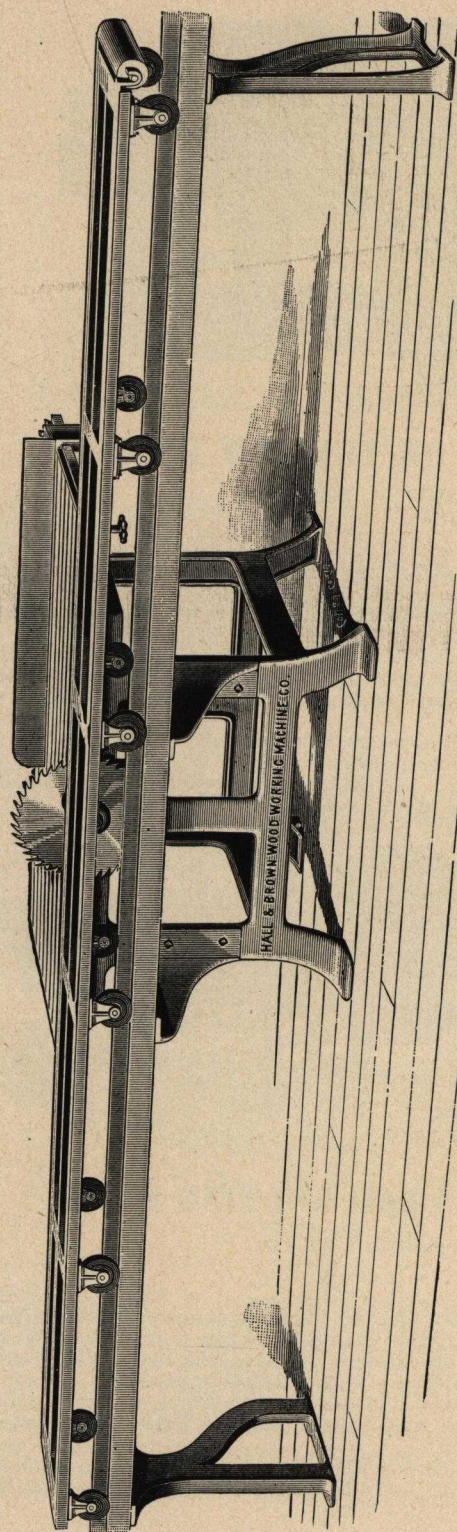
FRICTION FEED BOLTING SAW.

Weight, 1100 lbs.

This Machine will carry any saw up to 36 inches in diameter. Steel Arbor 24 inches in diameter, running in self-oiling composition boxes. Positive friction feed, simple and strong and enclosed so as to prevent all saw-dust from interfering with its working. Any bolt can be cut from one-fourth inch up to any thickness, and 12 inches in diameter.

Pulley on the Mandrel is 8 inches in diameter and 8 inch face, and with 36 inch saw should make 1000 revolutions per minute, and should be driven by a Pulley 27 or 28x8 inches on line shaft making 300 revolutions per minute.

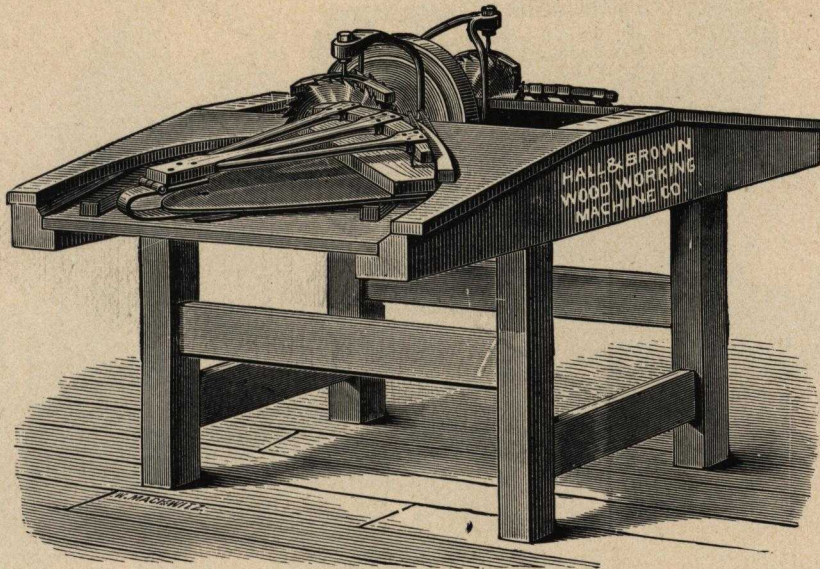
When Counter-shaft is ordered, unless otherwise advised, it will be furnished with Tight and Loose Pulleys, 12 inches in diameter and 8 inch face with 20x8 driver, and should make 400 revolutions per minute.



CARRIAGE EDGING SAW.

Weight of 16-Foot Machine, 1125 lbs.

This Machine is intended for jointing the edges of lumber, or splitting planks or boards and is provided with back table and splitting gauge. It is built entirely of iron and steel, except the top table or carriage, this being made of well seasoned hard maple, it being lighter will run easier. The carriage is mounted on large size iron rollers, consequently runs light. The Saw Mandrel is made large size and of the best quality of steel and runs in long boxes which are lined with the best quality of genuine babbit metal. We furnish with each Machine one 18-inch saw. The Pulley on the Mandrel is 6 inches in diameter, and $6\frac{1}{2}$ inch face, and should make 2200 revolutions per minute. When counter shaft is ordered, unless otherwise advised it will be furnished with Tight and Loose Pulleys, 12 inches in diameter and $6\frac{1}{2}$ inch face, and with 24-inch Driver which should make 550 revolutions per minute.

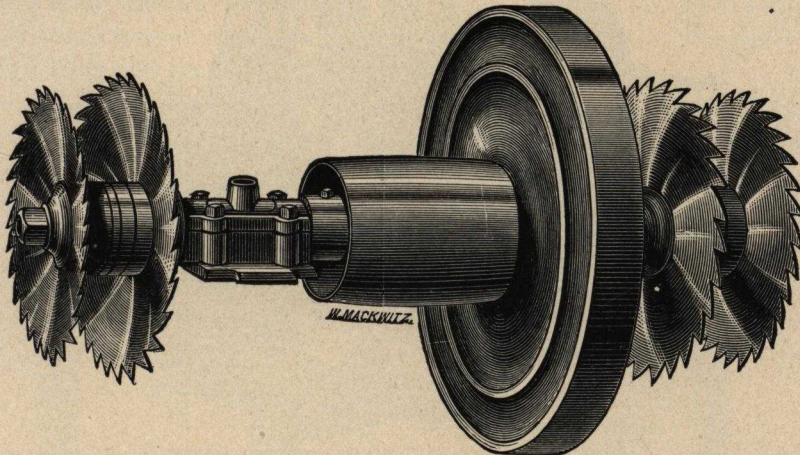


FELLOE SAWING MACHINE.

Weight, 750 lbs.

This Machine which has had extensive use and universal endorsement, is the only one manufactured which successfully accomplishes the design. We have made many improvements, and now offer it with confidence as a thoroughly reliable and perfect machine.

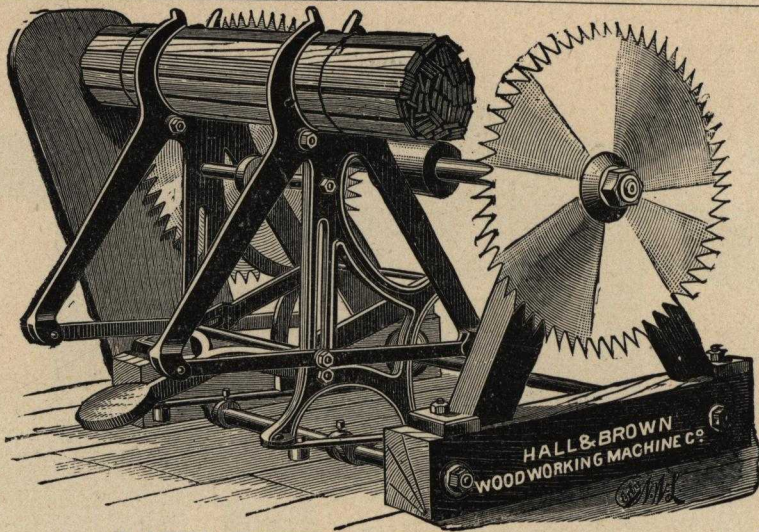
It consists of a Mandrel with Pulley and Boxes, four Concave Saws, two of which are on one end of the Mandrel to cut Felloes for the Front Wheel, and two on the other end to cut Felloes for the Hind Wheel, with washers between saws to allow the cutting of different thicknesses, as desired. A frame, constructed of the best seasoned material, and in the most substantial manner, each end of which is provided with an Iron Table, placed on rollers, and revolving on an iron track immediately underneath. On this the timber to be sawed is placed and fed to the saws with but slight exertion.



NOTE.—The Saws on left run same as those on right and not as shown in above cut.

With this Machine the operators can cut from 5000 to 6000 perfect felloes in ten hours, with less than half the labor required to perform the same work on the old style Solid Table. The Pulley, 8x9 inches should be driven by an 8 or 9 inch belt, and run about 2500 revolutions.

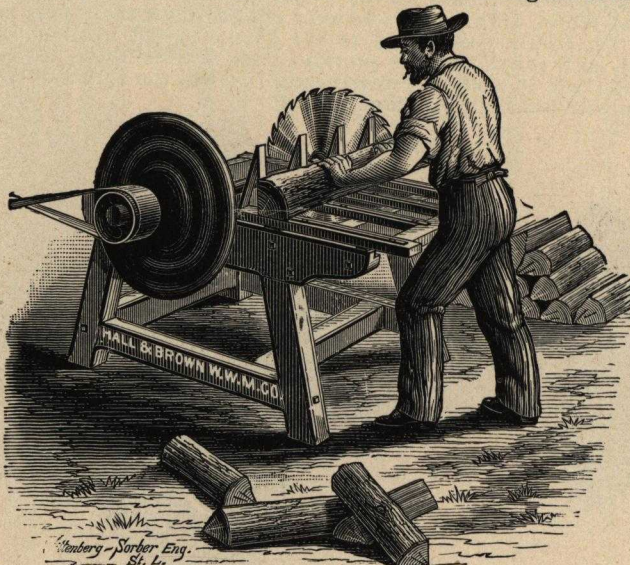
When Counter-shaft is ordered unless otherwise advised it will be furnished with Tight and Loose Pulleys 12 inches in diameter and 8½ inch face with 24 inch driver and should make 850 revolutions per minute.



LATH BINDER AND TRIMMER.

Weight, 580 lbs.

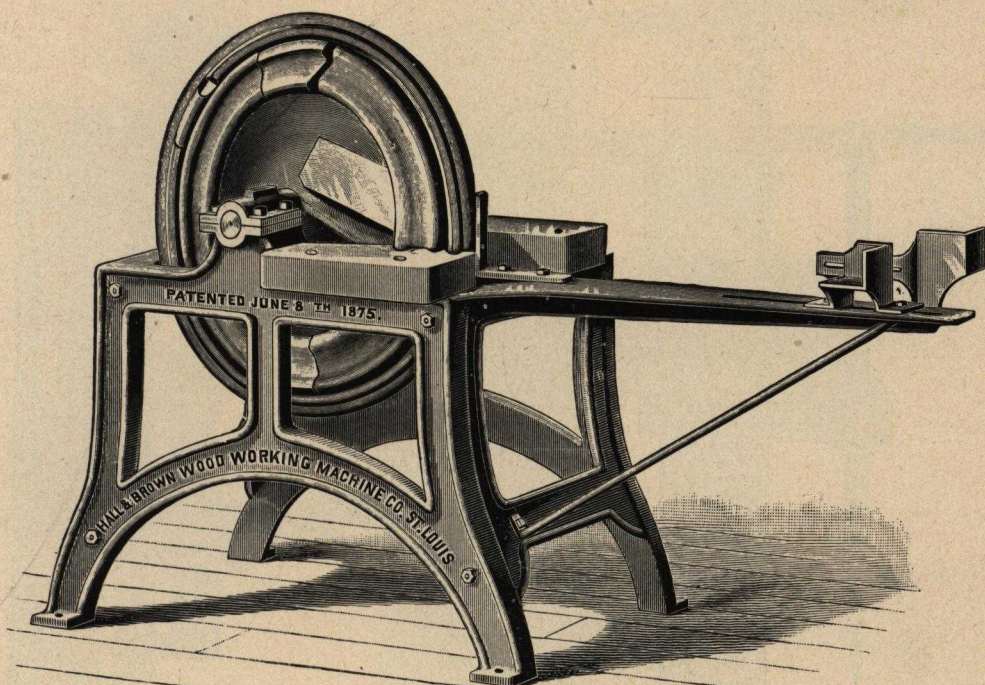
The above cut represents our improved Combination Lath Binder and Trimmer. By this arrangement the operator can trim the bundles of lath with very little extra work, simply by tilting the packing frame over from him, causing the bundle to pass between the saws, thereby trimming both ends at one movement. The lath being firmly held in the jaws of the Binder, permits the saws to make a smooth cut, which gives a nice appearance to the ends of the bundle. The bundle does not have to be removed from the Binder until after it is trimmed, thereby saving time and doing the work in a workmanlike manner. We furnish two saws with each trimmer for Binder, with 50 lath 26 inch saws, for 100 lath 28 inch saws. Mandrel Pulley is $4\frac{1}{2}$ inches in diameter and 5 inch face and should make 1,100 or 1,200 revolutions per minute, and should be driven by a 20x5 inch pulley on line shaft making 250 revolutions per minute.



CORD WOOD CUT-OFF SAW.

Weight, 300 lbs.

This machine is made expressly for wood yards and railway stations for cutting up wood any desired length. It is made strong and substantial, with large size steel saw Mandrel, with balance wheel attached. It can be belted in any direction desired, the pulley overhanging the frame. We furnish one 24-inch saw with each Machine. The pulley on the mandrel is $5\frac{1}{2}$ inches diameter and 6 inches face and should make from 1,200 to 1,500 revolutions per minute.



PICKET HEADER.

Weight, 600 lbs.

Heads four styles of pickets, as shown below; does more work and much better than can be done by any other machine, as it leaves the corners sharp and smooth, cuts two flat pickets at one operation, and does the work as fast as a man can handle the pickets. One man and a boy can cut from 5,000 to 8,000 per day of 10 hours.

These machines are made entirely of Iron and Steel, have a Tight and Loose Pulley, 8 inches in diameter by 4 inch face, and should run about 1,000 revolutions per minute. All machines are tested before leaving the factory, and are in running order when shipped.

Nº1



Nº2

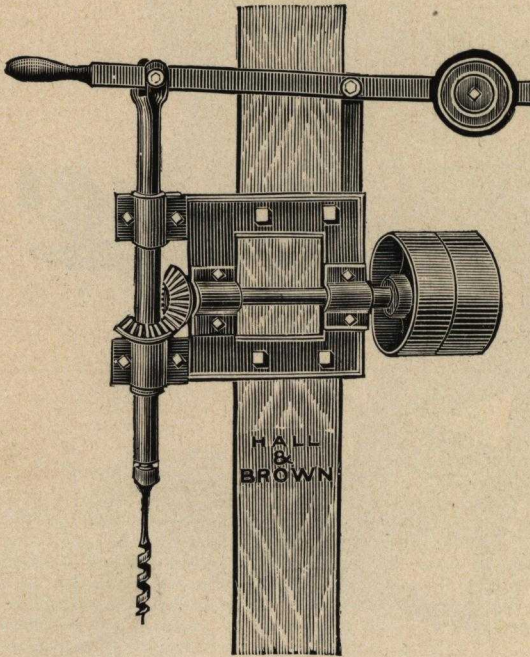


SQUARE
POINT



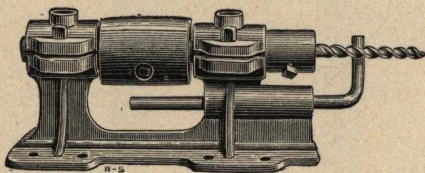
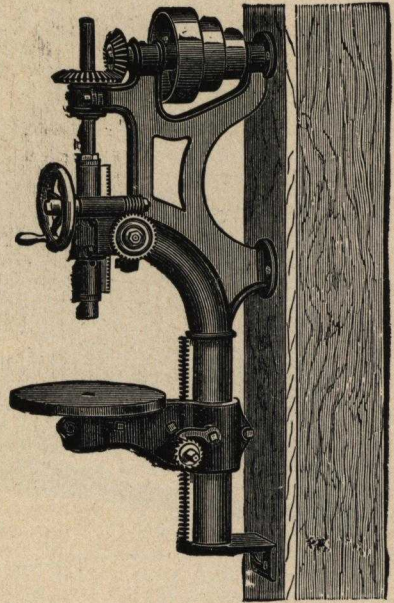
GOTHIC
POINT



FOR WOOD.**Post Borer Geared Spindle.**

Weight, 160 lbs.

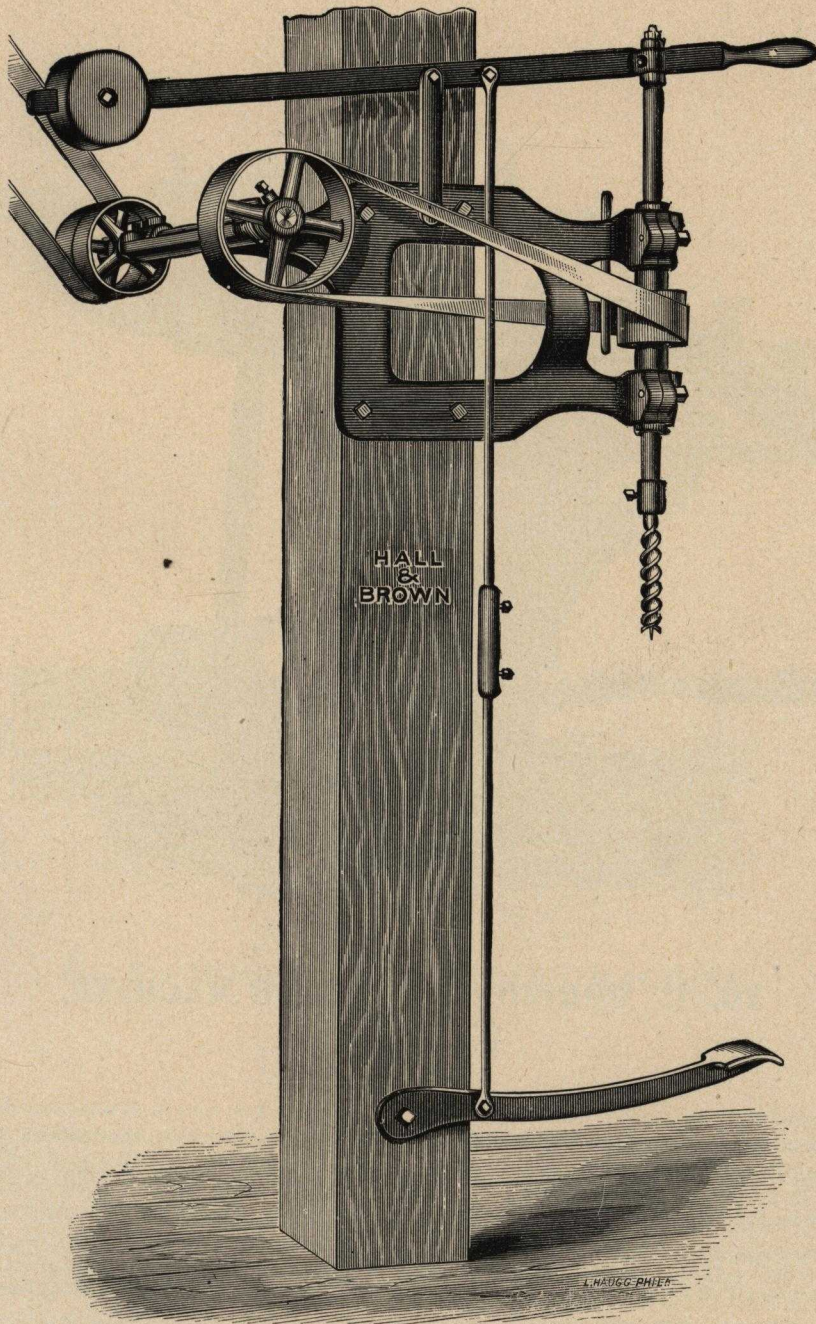
This low priced Borer will be found very convenient in Wood Working establishments where a cheap Borer is needed. It can be easily attached to any post. It will bore any size hole up to 2 inches, and to any depth not to exceed 8 inches, and is provided with a stop to regulate the depth desired. Tight and Loose Pulleys are 8 inches in diameter and $3\frac{1}{2}$ inches face, and should make 850 revolutions per minute.

**BENCH BORER.****FOR IRON.****DRILL PRESS FOR IRON.**

Swings 18 Inches.

Weight, Complete, with Counter Shaft,
400 lbs.

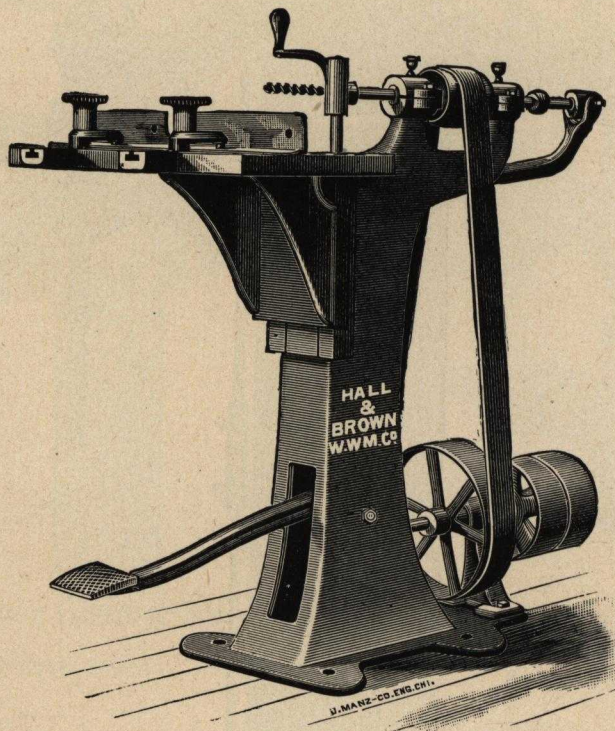
This low priced Iron Drill Press will be found almost indispensable in any Wood Working establishment. It occupies little space and can be readily attached to any post, and if desired can be placed in the engine room convenient for the engineer and always ready for use. Will guarantee this Press to drill any size hole up to 1 inch as rapidly and as well as can be done on a Drill Press costing twice as much. The Tight and Loose Pulleys are 8 inches in diameter and $3\frac{1}{2}$ inches face, and should make 460 revolutions per minute.



POST BORER BELTED SPINDLE.

Weight 185 lbs.

* The above cut represents a low priced Post Borer which is simple in construction and can be attached to any post and run at a high rate of speed and is noiseless. It is strongly belted sufficient for a 2-inch bit and over if desired. It can be operated either by hand or by foot. The treadle can be adjusted or regulated in height to suit the operator. It can be adjusted to stop the bit at any depth up to eight inches. The spindle is made of the best quality of crucible steel, the chuck is made to receive machine bits with $\frac{1}{2}$ inch shanks; universal chucks fitted to the spindle to hold bits from 0 to $\frac{1}{2}$ inch would be extra at cost. All bits for the machine would be extra according to number and size wanted, Tight and Loose Pulleys are 8 inches in diameter and $3\frac{1}{2}$ inches face, and should make from 1200 to 1500 revolutions per minute.



NO. 1. HORIZONTAL BORING MACHINE.

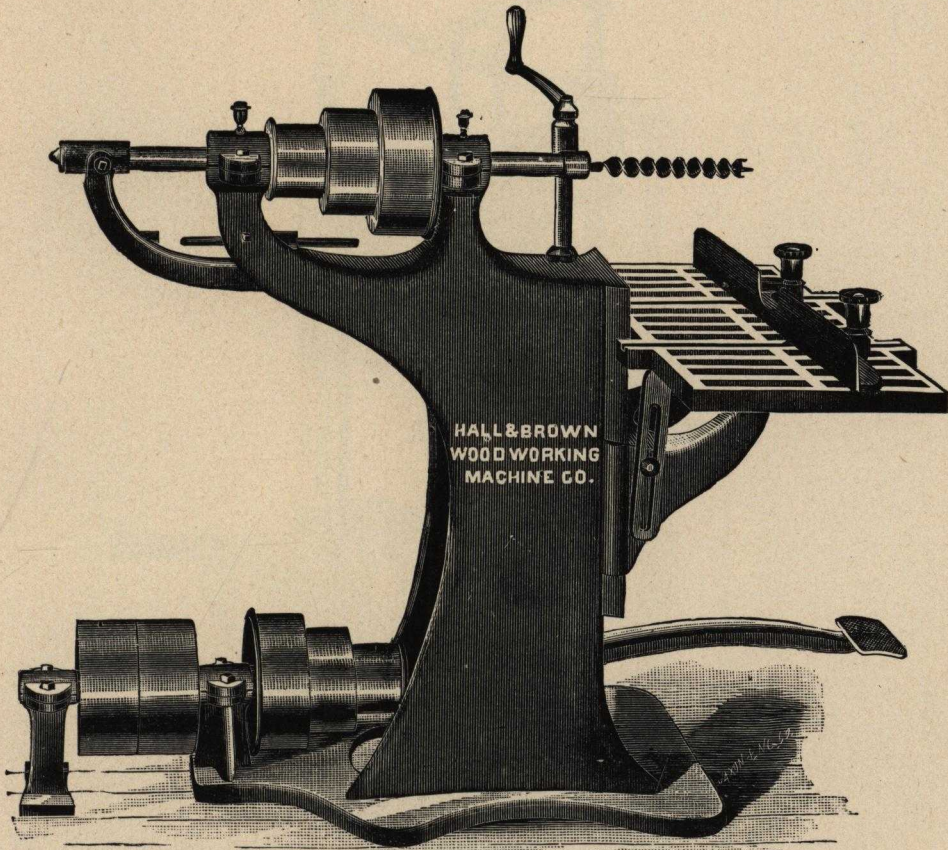
Weight, 400 lbs.

This machine is of a new design. The column is cast in one piece, the table is gibbed to the column and raises to accommodate any thickness of stuff up to six inches, by a single screw. The guide on the table is adjustable to any angle on the plane of the arbor. The bit is brought forward to the work by means of a treadle, and returned by a counter-weight. The boring arbor has a travel of eight inches. The machine is very substantial and the workmanship is first-class. Tight and Loose Pulleys on counter are 8x3 and should make 800 revolutions per minute.

BELTS WHEN ORDERED.

Driving belt 3 inches wide, in length to suit from line shaft.

One Spindle belt 6 feet 10 inches long, 3 inches wide.



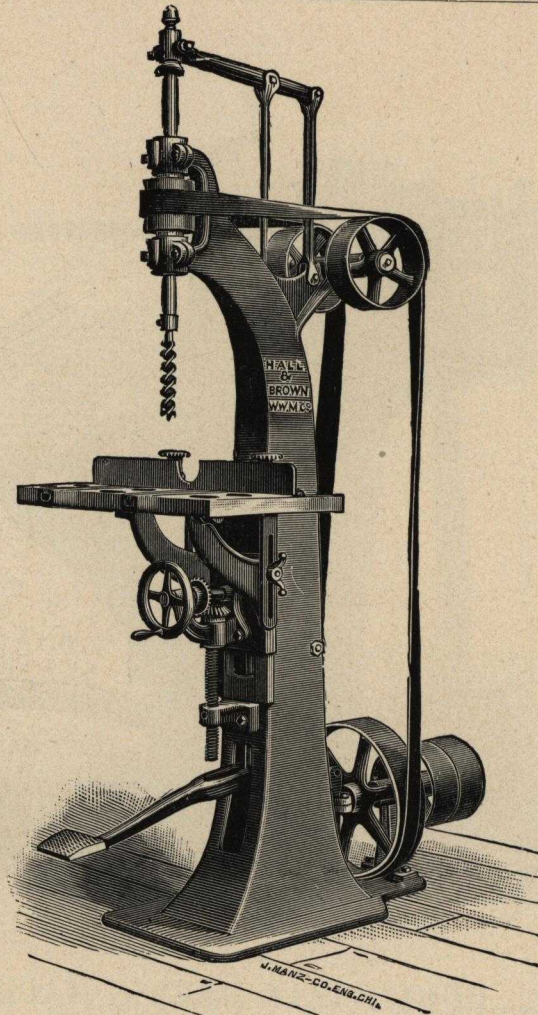
No. 2. HORIZONTAL BORING MACHINE.

Weight, 600 lbs.

This machine is of new and substantial construction. The main part of it being cast in one piece makes it very durable. It is adapted to all kinds of boring in Agricultural Implements, Wagon and Furniture Shops. The table is gibbed to slides cast on the column, and is adjustable vertically to accommodate the different thicknesses of stuff by means of a single screw, and has a radial adjustment for boring at any desired upward or downward angle. The fender moves in planed slides, and is adjustable to different widths and for boring at any angle. The traversing steel spindle is operated by means of a powerful jointed treadle, fitted with an improved step. It is supplied with three cones giving three changes of speed, and an adjustable collar to gauge the depth of the hole to be bored. The treadle has a weighted counter-balance giving a quick return to the spindle. The machine is provided with counter-shaft, is complete in itself, and easy to operate and keep in order. A wrench and five auger bits accompany each machine. It has Tight and Loose Pulleys, 8 inches in diameter and 3 inch face, and should make 1000 revolutions.

BELTS WHEN ORDERED.

Driving Belt 3 inches wide, in length to suit from line shaft.
One Spindle Belt 6 feet 10 inches long, 3 inches wide.



No. 1. VERTICAL BORING MACHINE.

Weight, 550 lbs.

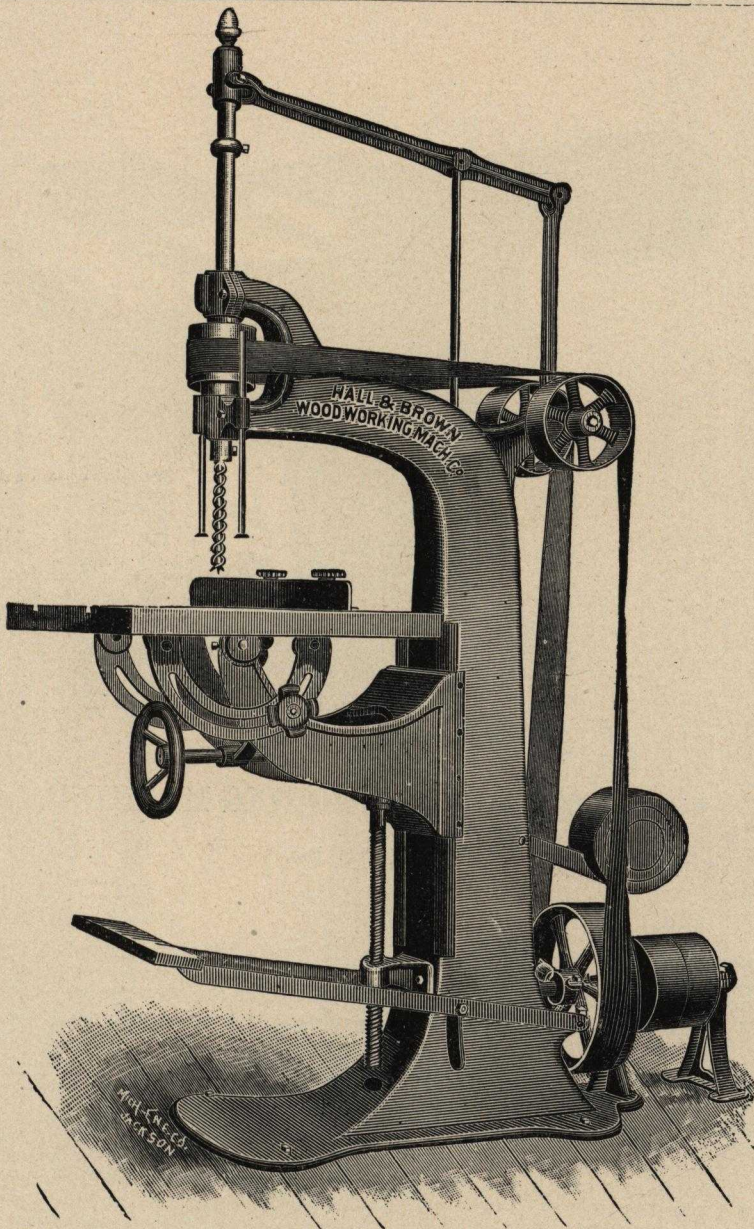
This machine is intended for use in chair, furniture and agricultural implement factories, and will be found well adapted for straight or angular boring. The table has an angle adjustment of 30 degrees, and the face is adjusted by sliding the holding bolts in the slots in the face of the table. When in operation the table is fixed in position. The boring spindle is brought down to the work by a treadle operated by the foot of the operator, and is returned from the work by counter-weight connected in the column. The spindle has a movement of eight inches, is nine inches from column and will bore to the center of eighteen inches. The depth of hole is gauged by an adjustable collar on boring arbor or spindle. The table is raised and lowered by a screw easily accessible to the operator.

This machine is of neat and substantial construction, has counter-shaft attached, is self-contained and ready for driving belt. Wrenches and five auger bits furnished with each machine. Tight and Loose Pulleys 8x3 inches, and should make 750 revolutions.

BELTS WHEN ORDERED.

Driving Belt, in length to suit from line shaft.

One Spindle Belt, 13 feet 5 inches long, 2½ inches wide.



No. 2. VERTICAL BORING MACHINE.

Weight, 1000 lbs.

This Machine is designed to meet a demand for a machine having more capacity and larger range than is usually found in single spindle machines. The table is gibbed to planed ways cast on the column and is raised and lowered by a screw. The actuating hand wheel is under the table within easy reach of the operator. The table has a movement on the column of twelve inches, and an angular adjustment of 40 degrees, and the fence is adjusted by sliding the holding bolts in the slots made in the face of the table. The boring spindle is brought down to the work by a treadle operated by the foot of operator, and is returned from the work by a counter-weighted lever connected at the top. The spindle is $1\frac{1}{4}$ inches in diameter, has a movement of 12 inches and is 18 inches from the column, allowing the boring of a hole in the center of 36 inches.

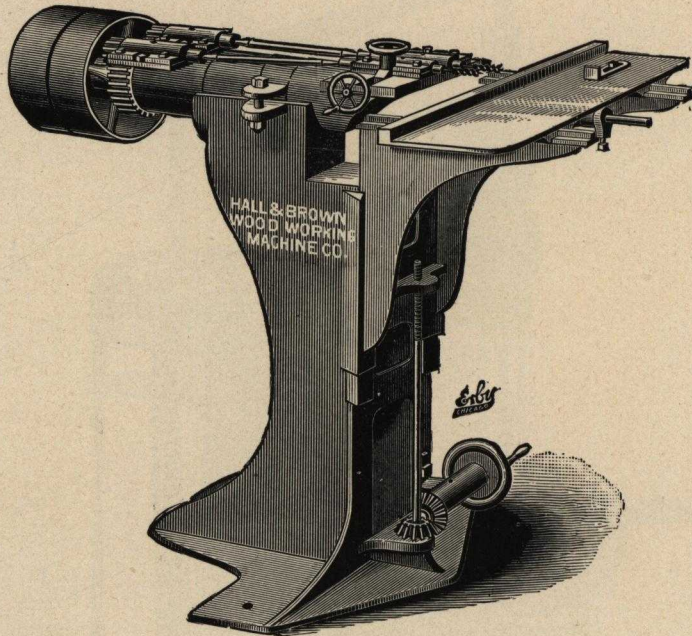
A wrench and five auger bits go with each machine.

Tight and Loose Pulleys are 10 inches in diameter and 4 inch face and should make 500 revolutions per minute.

BELTS WHEN ORDERED.

Driving belt in length to suit from line shaft.

One Spindle belt, 16 feet 1 inch long, 3 inches wide.



NO. 1. DOUBLE BIT BORING MACHINE.

Weight, 350 lbs.

The above cut represents our No. 1 Double Bit Boring Machine intended for furniture, Dowel boring, or for other purposes where two holes are to be bored accurately from 1 to 6½ inches from center to center. Our No. 2 and No. 3 Machines are of the same design.

Our No. 2 Machine is also a two bit Machine and will bore holes from one to ten from center to center.

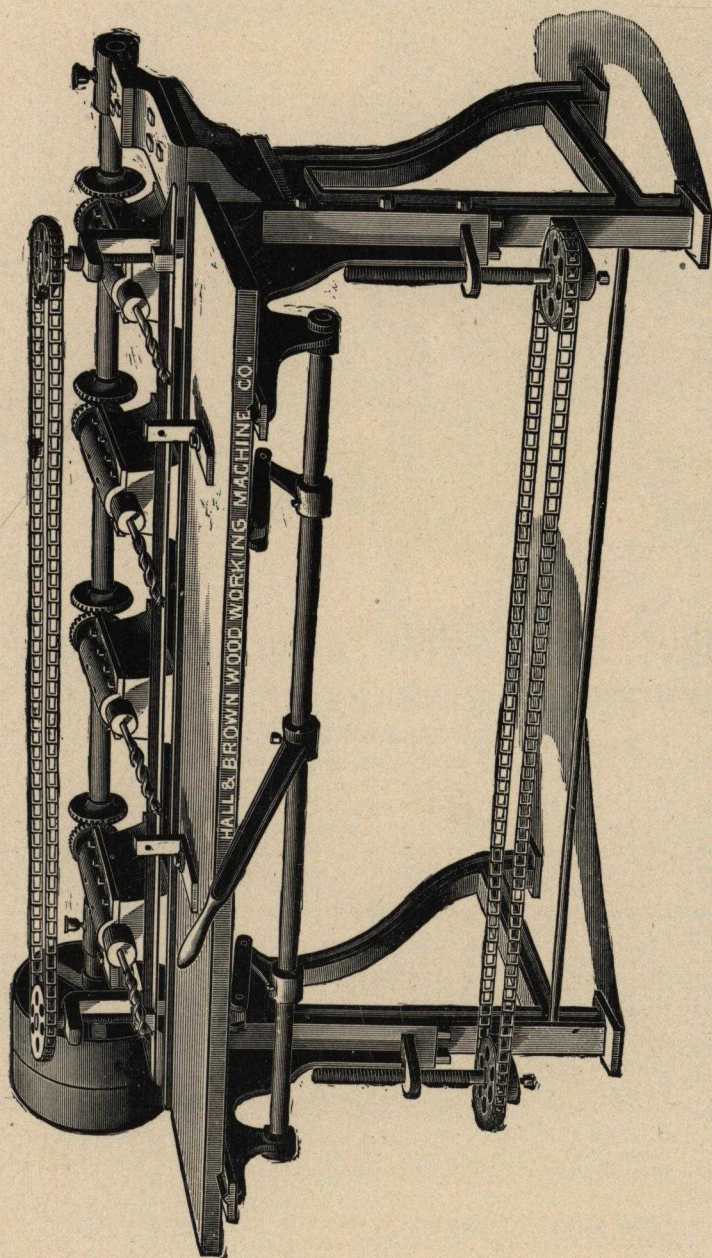
Our No. 3 Machine is a three bit machine and will bore holes one inch between centers, and the extreme length between centers of the two outside bits is 6½ inches apart.

The adjustment of the bits are all controlled by one bolt and hand wheel; no wrench being required to set the bits, effecting a great saving in time of adjustment. The entire boring head is movable—to bore at any angle from the horizontal to the vertical, by merely loosening one screw. The frame is cast in one piece with slides also cast on. Bed is provided with mitre gear and hand wheel to raise and lower, and has a range of eight inches; bed is provided with iron table accurately planed and fitted on V planed ways, with adjustable stops, for gauging depth of hole. The bit spindles are held in separable journals connected to driving pinions by steel tumbling rods accurately fitted with ball and pinion joints, being driven from main gear attached to driving pulley.

One point that we would call particular attention to is that the machine requires no counter shaft, as tight and loose pulleys are attached to machine and can be driven direct from line shaft.

Machine is easy of adjustment and not liable to get out of repair, and the great advantage of a double spindle machine is too well known to require an explanation.

Bit sockets unless otherwise ordered are made to fit screw shank bits. We have given the machine a thorough test and we place it upon the market knowing that it will meet a long felt want for a compact, neat and simple boring machine, free from a complication of small gear, which at every adjustment of the bits require a corresponding adjustment of gear. The Tight and Loose Pulleys are 10 inches in diameter and 3½ inches face, and should make 400 revolutions per minute.



No. 5. FOUR SPINDLE MULTIPLE BORER.

Weight, 1100 lbs.

The above cut represents our No. 5 Multiple Borer with four bits, which will bore any size hole 2 inches from center to center, the two outside bits boring 5 feet between centers. Either spindle can be moved independently the entire length of the bed and held firmly in position by a strap and stud. The spindles are all driven from the main driving shaft which has tight and loose pulleys attached.

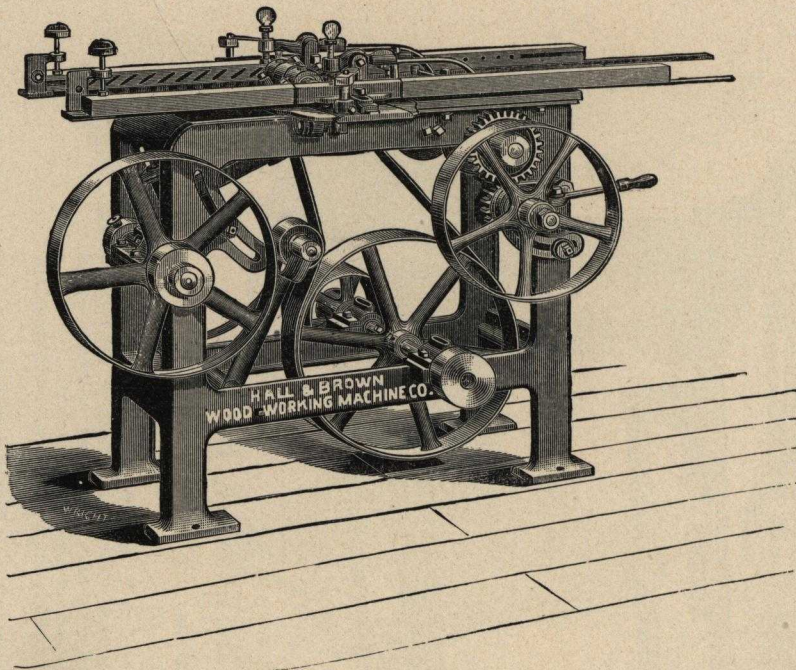
All the gearing is cut from the solid steel, and the driving pinions are made of aluminum bronze.

The Machine is provided with a clamp for holding work firmly and accurately on the table while being bored. The spindle is fitted for $\frac{1}{4}$ inch shank Machine bits.

We are prepared to furnish these Lathes with any length bed required from 5 to 10 feet and with from 4 to 10 spindles as ordered.

Tight and Loose Pulleys on the No. 5 Machine are 13 inches in diameter and 4 inch face and should make 450 revolutions per minute.

The Tight and Loose Pulleys on the No. 11 Machine with 10 spindles and 6 foot bed are 16 inches in diameter and 5 inch face and should make 450 revolutions per minute.



IMPROVED AUTOMATIC BLIND STILE MORTISING AND BORING MACHINE.

Weight, 600 lbs.

The above cut represents our improved machine for mortising and boring blind stiles. It is perfectly automatic, reliable and capable of doing work rapidly and in a first class manner. The feed mechanism is positive, and the machine will mortise and bore two stiles at the same time. The stiles being mortised and bored in pairs, the change from mortising to boring can be made instantly without stopping the machine. In mortising stiles for long blinds without middle rail, the mortise for the centre slat in stationary blinds is usually made $\frac{3}{8}$ inch deeper than the others, in order to pin the slat. This can be done on this machine instantly without stopping operation.

The machine is made from new patterns of new designs, being both rigid and durable, as well as very quick working.

Tight and Loose Pulleys, 8x3, and should make 650 revolutions per minute.

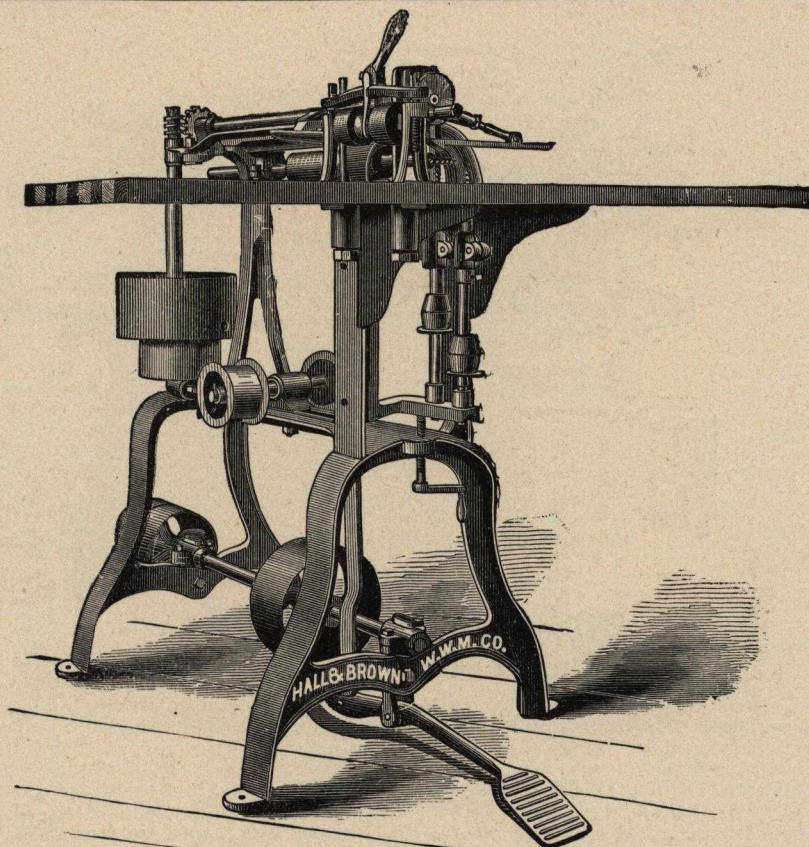
BELTS WHEN ORDERED.

Driving Belt, 3 inches wide, in length to suit from line shaft.

One Belt, 7 feet 6 inches long, 2 inches wide.

One Belt, 7 feet 5 inches long, 2 inches wide.

One Belt, 7 feet 4 inches long, 2 inches wide.



IMPROVED BLIND STILE SPACING AND BORING MACHINE.

Capacity, 8,000 Holes Per Hour.

Weight, 275 lbs.

This Machine is now built from new patterns, well proportioned and very heavy, and with the exception of the well-seasoned wood table (made from alternate strips of ash and walnut), is entirely built of iron, steel and brass. The late improvement consists in dispensing with the independent counter-shaft, thereby occupying much less floor space; by the use of an eccentric pin, instead of a spring, which insures a positive drop to the gate and obviates the breaking of bits; and also the attachment of a horizontal arbor and bit for general work, when so ordered—making the machine, as shown in the above cut, the most complete as well as the cheapest Spacing and Boring Machine ever placed upon the market.

HOW THE MACHINE IS OPERATED.

The stiles after being jointed are placed upon the table, with a ratchet or pattern between them, the lower end of the stiles resting against two blocks, which are securely fastened to the ends of the pattern, and are moved over the bits by means of a pawl working in the notches of the pattern. It spaces its own work with perfect accuracy, at any distance apart, from 1 to 1½ inches, and bores the entire length of the stile without stopping to skip the lock-rail mortise, the whole operation being done automatically and without the aid of the operator. The mortise are marked on the edge of a thin strip which has been previously lain off and tacked to the side of the pattern, which can be replaced with any length required. The stiles and patterns should be clamped together before removing them from under the pressure roll so that they may be inverted while the mortises are marked on the face edge. The two vertical bits are used for blinds only, and bore from the under side of the stiles, thereby leaving the holes of a uniform depth, so that the pivot of the slat may work on the end instead of the shoulder, which renders them less liable to bind or to become stuck fast by the paint.

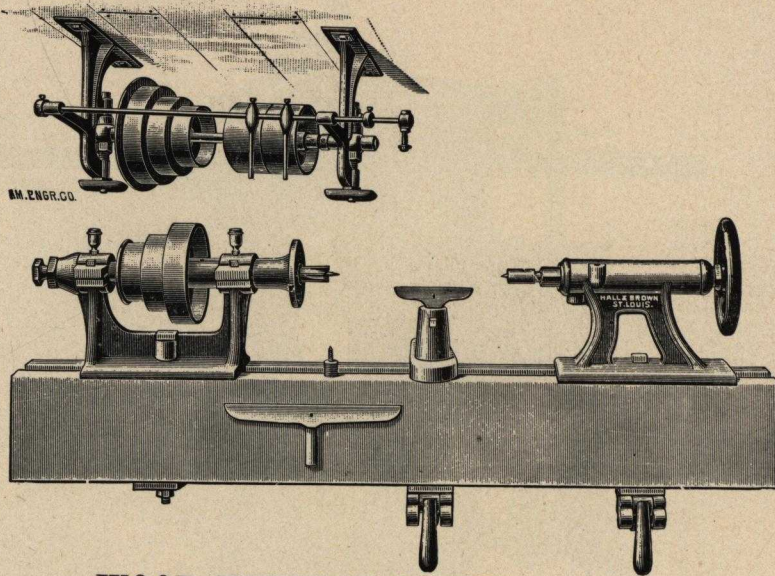
The Tight and Loose Pulleys are 6½ inches in diameter and 3 inch face and should make 800 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt 3 inches wide, in length to suit from line shaft.

One Belt, 12 feet 4 inches long, 1½ inch wide.

One Belt, 7 feet 5 inches long, 2¼ inch wide.



WOOD TURNING LATHE.

For Manual Training Schools.

Weight 200 lbs.

This Lathe was especially designed for Manual Training Schools, although it can be used to great advantage for light work, and costs less than the regular Mill or Cabinet Lathe.

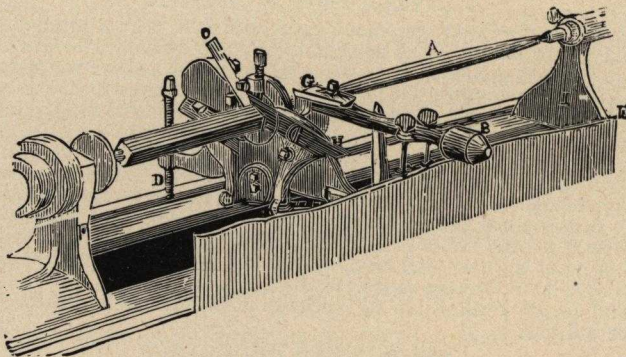
Since it was brought out we have furnished many schools throughout the country with from one to six dozen each. We only make one size of this Lathe 12 inch Swing. It has many features which our regular Mill Lathe does not contain. They are built with great care. All of the spindles are of the best quality of steel. The counter shaft is steel and runs in ball and socket Hanger Boxes. Both cones, upper and lower are of iron turned up true inside and out and in perfect balance. The Head and Tail stocks are planed true in line with the Spindles. The rest socket is fitted to a separate plate with a corresponding plate under the shears of the Lathe. The rest and tail stock are both fastened in place by a cone, all adjustable parts being planed off.

We furnish with each Lathe, one rest socket, two rests, one spur driver, one tail center, face plate and rosette chuck.

Tight and Loose Pulleys on the counter shaft are six inches in diameter and 3 inch face and should make 1000 revolutions per minute.

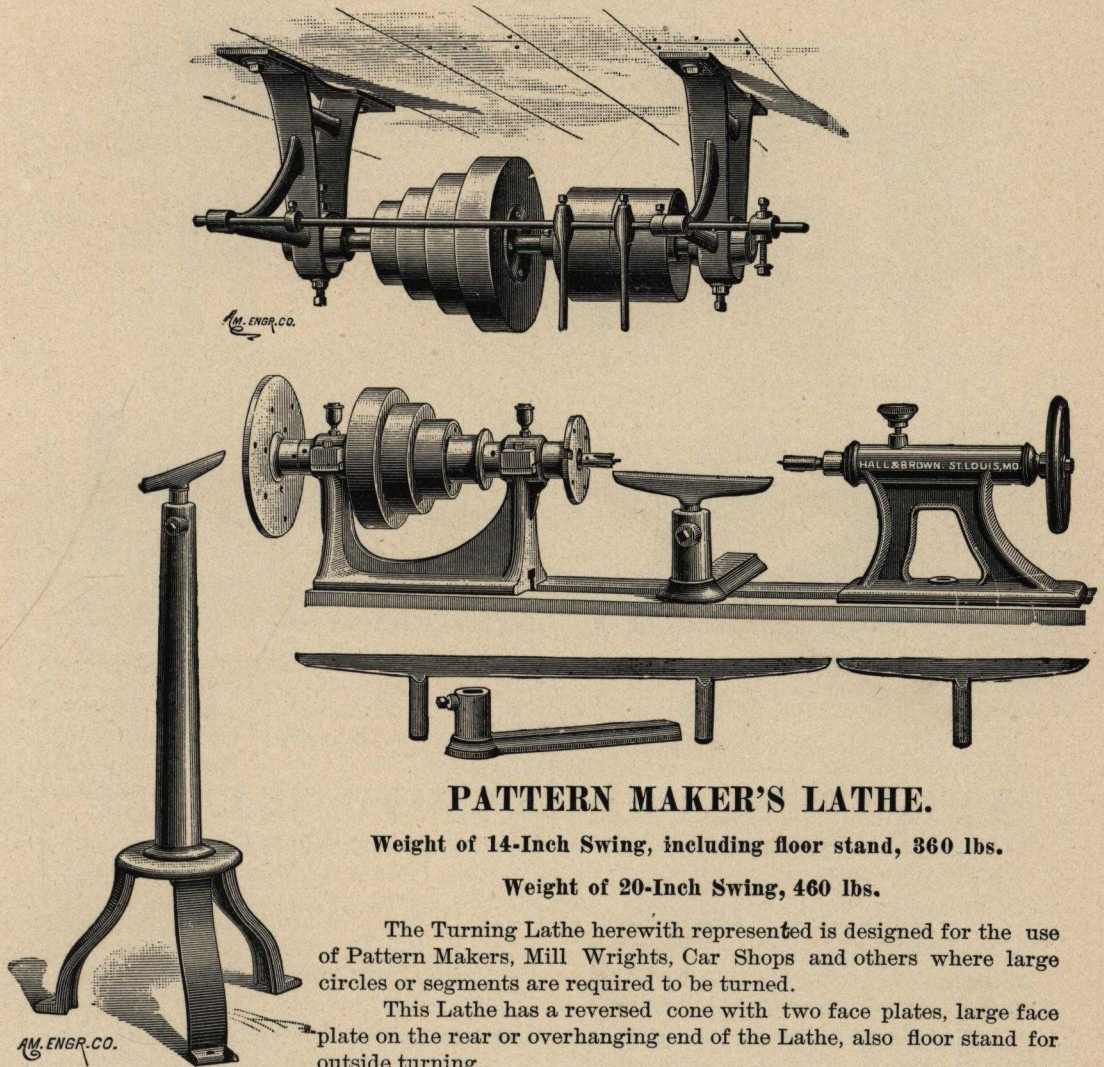
BELTS WHEN ORDERED.

Driving Belts in length to suit from line shaft.



Alcott's Lathe Fixture,

For Turning Broom Handles on a Common Lathe.



PATTERN MAKER'S LATHE.

Weight of 14-Inch Swing, including floor stand, 360 lbs.

Weight of 20-Inch Swing, 460 lbs.

The Turning Lathe herewith represented is designed for the use of Pattern Makers, Mill Wrights, Car Shops and others where large circles or segments are required to be turned.

This Lathe has a reversed cone with two face plates, large face plate on the rear or overhanging end of the Lathe, also floor stand for outside turning.

These Lathes are made with the greatest care, all parts being made to duplicate the spindles and centers being made of the best cast steel.

The base of both head and tail-stocks are accurately planed upon centers so that they will be true to line when set on the shears; the cones are made of cherry, thoroughly dry and glued up in layers across the grain, and firmly fastened by flanges at both ends and both cones and pulleys carefully balanced.

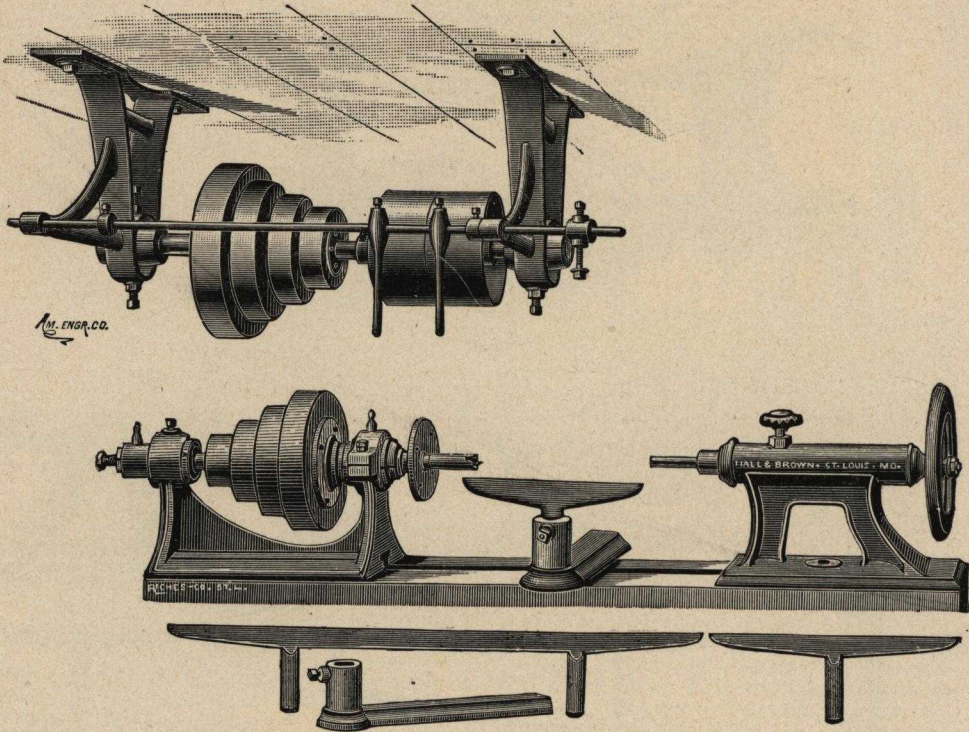
The head-stock and boxes in which the cone spindle revolves are planed to a perfect fit and the boxes lined with a heavy lining of genuine babbitt metal, and the boxes carefully scraped.

The Lathe consists of head and tail-stocks, front and rear face plates, five point driver and cup tail center, one rosette chuck, two rest sockets, two T and one double end rests, three bolts with clamps and wheels for tightening down the rests and tail-stocks, two bolts and nuts for bolting down head-stocks. Counter-shaft with Tight and Loose Pulleys and hangers.

We manufacture four sizes of these Lathes, viz: 14, 16, 18 and 20 inches swing.

The Tight and Loose Pulleys for all these Lathes are 6 inches in diameter and $3\frac{1}{2}$ inches face, and should make 800 revolutions per minute.

We can furnish this Lathe with or without floor stand, as desired.



WOOD TURNING LATHE FOR GENERAL MILL WORK.

Weight of 14-Inch Swing, 285 lbs.

Weight of 20-Inch Swing, 380 lbs.

These Lathes are made with great care from new and improved patterns, and nothing but the best material enters their construction.

Each of the different parts, such as face plates and centres being made to templets so that duplicates can be ordered at any time.

The boxes for the head-stock spindle are planed into the head-stock and fitted with care and lined with a thick lining of the best genuine babbitt metal; both spindles and centers being made of the best quality of steel.

The base of both head and tail-stocks are planed off true, and in line with the spindles.

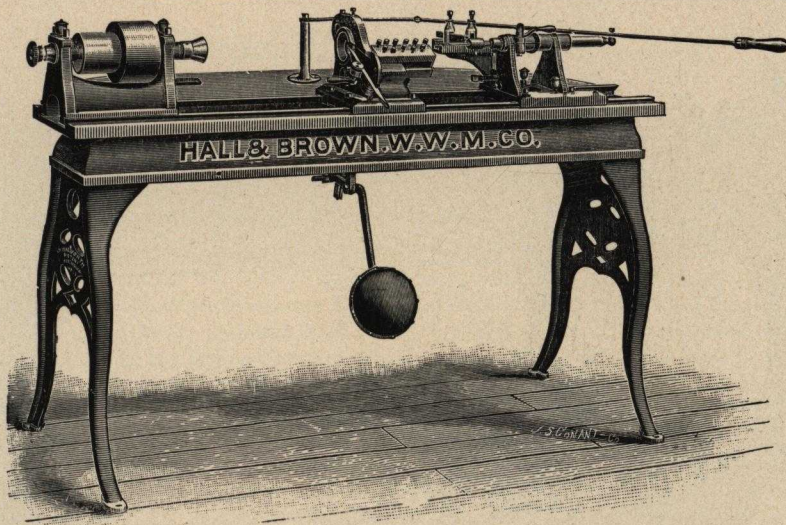
The cones are made of kiln dried cherry and glued up in layers across the grain and firmly fastened at both ends.

All running parts are carefully balanced, which all wood turners will admit is very important.

The Lathe consists of a head and tail-stock, countershaft, hangers and pulleys, one face plate, one five point driver, one female center and rosette chuck, two rest sockets, two T and one double end rest, three bolts with clamps and wheels for tightening rests and tail-stock, two bolts and nuts for tightening head-stock.

We manufacture four sizes of these Lathes, 14, 16, 18 and 20 inch swing.

The Tight and Loose Pulleys for these Lathes are 6 inches in diameter and $3\frac{1}{2}$ inch face, and should make 800 revolutions per minute.



VARIETY WOOD TURNING LATHE.

For the rapid production of nearly every variety of wood turning this lathe has no equal, either in capacity or quality. It easily produces from 4,000 to 10,000 nicely finished pieces of the following kinds in ten hours, and the turning is in most cases more perfect than hand work and perfectly uniform: Druggists' boxes, blueing boxes, sleeve buttons, button moulds, tassel moulds, bonnet stands, bobbin bushings, balls, bungs, knobs, tops, toys, tent buttons, dowels, piano pins, parlor croquet, pencil cases, organ stops, whip sockets, wooden jewelry, curtain fixtures, wheels, spools, pipes, pipe stems, faucets, checkers, rosettes, file handles, auger handles, paint brush handles, stencil brush handles, lather brush handles, button hook handles, wrench handles, hubs and spokes for children's carriages, and ornamental turnings of all kinds.

These lathes bore, bead and turn, at the same time, such work as tassel moulds, pencil cases, handles, etc., cutting down for tenons, ferrules and shoulders, in the most perfect manner and the whole work is performed without the use of any hand tools whatever.

We can furnish Lathes of the following sizes, complete with counter-shafts, one ring, three chucks and knives for turning one article, all other knives for various articles extra.

No. 1, 5 feet 6 inches, Bed, works stock up to 2 inches in diameter; weight, 700 lbs.

No. 2, 5 feet 9 inches, Bed, works stock up to 2½ inches in diameter; weight, 800 lbs.

No. 3, 5 feet 9 inches, Bed, works stock up to 3 inches in diameter; weight, 900 lbs.

No. 4, 6 feet 6 inches, Bed, works stock up to 3½ inches in diameter; weight, 1000 lbs.

No. 5, 6 feet 6 inches, Bed, works stock up to 3¾ inches in diameter; weight, 1050 lbs.

No. 6, 8 feet, Bed, works stock up to 4½ inches in diameter; weight, 1800 lbs.

Nos. 1, 2, 3, 4 and 5 Lathes turn 2 feet in length, if desired, the No. 6 Lathe 4 feet.

The Tight and Loose Pulleys for Nos. 1 and 2 Lathes are 8 inches in diameter and 4½ inch face.

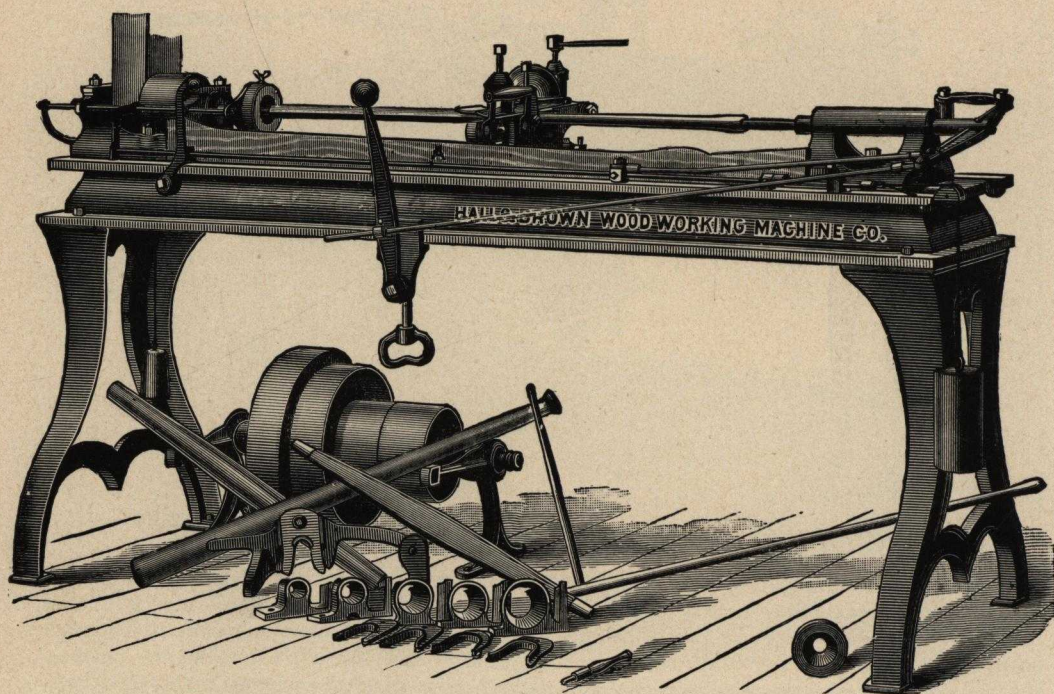
The Tight and Loose Pulleys for the No. 3 Lathe are 9 inches in diameter and 4½ inch face.

The Tight and Loose Pulleys for Nos. 4 and 5 Lathes are 10 inches in diameter and 4½ inch face.

The Tight and Loose Pulleys for the No. 6 Lathe are 10 inches in diameter and 6 inch face.

All the above counter-shafts should make 500 revolutions per minute to give the lathes the proper speed, and should be placed directly over the center of the spindle of the headstock of the lathe, then the boxes will wear straight up and not sideways.

Extra rings, chucks, knives, tools and attachments for turning various articles and long handles, furnished on application at reasonable prices, after a pattern or sample of the work is submitted to us for inspection.



No. 1. SELF-CENTERING AND SELF-DISCHARGING GAUGE LATHE.

Weight for Broom Handles, only, 710 lbs.

Weight, 7 foot 8 inch Lathe, for General Work, 1090 lbs.

This Lathe which has received such marked favor from our customers, fills a want that has been long felt for a Gauge Lathe than those heretofore in the market for turning handles for brooms, mops, forks, hoes, rakes, spokes for children's carriages, fishing rods, etc., and for turning ball bats and a variety of pieces used in the manufacture of furniture and wooden-ware, and agricultural tools. The points of superiority which this possesses over all other Gauge Lathes consist in superior workmanship and design, and also a large number of detail improvements, the principal of which are as follows: A small guard placed on the follower regulates the thickness of the shaving being taken by the finishing knife, and prevents the knives running away and digging into the stick. With this guard set correctly the Lathe will nearly feed itself, requiring very little exertion on the part of the operator. The head and tail-blocks are milled out so as to fit the ways and have a bearing over their entire length so that the blocks can be set over the ends of the bed so as to turn four inches longer than the lengths given in the list, if desired. The lengths given in the list are what the Lathes will turn with the head and tail-blocks set at the ends of the bed, and shorter lengths can be turned by moving the tail-block towards the head-block. This may be easily done by slackening the two bolts that hold the tail-block down, and adjusting the rods to proper lengths. The releasing dog is adjustable to the extent of about four inches to allow for the wear of the centre or the setting over of the head-block to turn longer lengths.

The usual manner of placing the releasing dog necessitates very fine fitting and is the cause of its being very liable to get out of order. The method we have adopted secures the proper working of the dog and precludes all possibility of derangement, hence our Lathe is the only one in which this dog can be duplicated with certainty of working properly. Provision is made to prevent the tail centre from being pulled out with the finished handle. By special devices it is easy to make very delicate adjustment

Description of Gauge Lathe.—Continued.

of dies to compensate for wear and thus prevent a die being rendered useless by wear of the carriage. Ample means of adjustment are provided to take up the wear of the carriage. Considerable trouble has heretofore been experienced in setting the follower to finish work to an accurate size, so we have employed the expedient of raising or lowering the follower with a screw, by means of which small amounts can be adjusted very expeditiously. This improvement saves a great deal of time and annoyance. The connections between the dogging and releasing rods and the tail spindle lever are ball joints, which play in all directions, thus working easier than in other machines, and obviating any tendency to bind in the joints. All the rods in the machine are polished steel. Very perfect means of adjustment are provided for taking up the wear of the divided brass journal boxes in which the head spindle runs in order to keep the centres perfectly in line. A bronze adjusting screw is placed back of the head spindle to receive the thrust. A small projection or bumper is provided on the tail block to stop the carriage on its return and keep the knives from striking. The lack of this has caused the breakage of many knives. When changing the size of work the self-centering rings are to be changed. The rings are separate and are fastened in by a thumb-screw, so a change of rings is but the work of a moment. The yoke which carries the ring should never be disturbed.

When a piece is placed on the Lathe it should be placed in the centering ring first with one side up—not a corner—then the carriage should be brought up and the other end allowed to enter the die. This will keep the corners out of the knife slot in the die. The tail center is now to be brought up sharply and the stick will instantly start to revolve.

The Lathes are all arranged to automatically centre the piece when put in, and to release and drop it down through the bed when finished. The top of the bed is planed off true for a bearing of a pattern A, which is made of hard wood or metal, about one inch thick, and fastened to the bed by means of bolts provided for the purpose. The pattern is to be shaped on its upper edge, so as to cause the knives to turn the desired shape, and it must be long enough to prevent the follower running off at the ends, which would let the knives strike the centres. The patterns are made by the customers to suit the various form of articles they may desire to turn. Attachments for tenoning, and for various special classes of work, will be made to order. To make prices of these specials it will be necessary that samples or accurate drawings of the articles be sent to us.

Dies are sent with the 7 feet 8 inch, the 4 feet 8 inch, and the 3 feet 8 inch Lathes of the following sizes, viz: $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$ and $2\frac{1}{4}$ inch. Any other size of dies under $2\frac{1}{4}$ inches will be furnished at a small additional charge. These longer Lathes will all turn broom handles just as well as the "broom handle" Lathe. The Lathe especially for broom handles will turn 3 feet 8 inches long, and is supplied with a die $1\frac{1}{4}$ inch in diameter. If a die $1\frac{1}{2}$ inch is desired, instead of $1\frac{1}{4}$ inch, it will be substituted at the same price. The Lathes can be adapted to turn articles somewhat larger than $2\frac{1}{4}$ inch diameter, and for such classes of work special prices will be made on application, when we are informed in regard to the sizes. For articles larger than $2\frac{1}{4}$ inches in diameter we make a larger and much heavier Lathe.

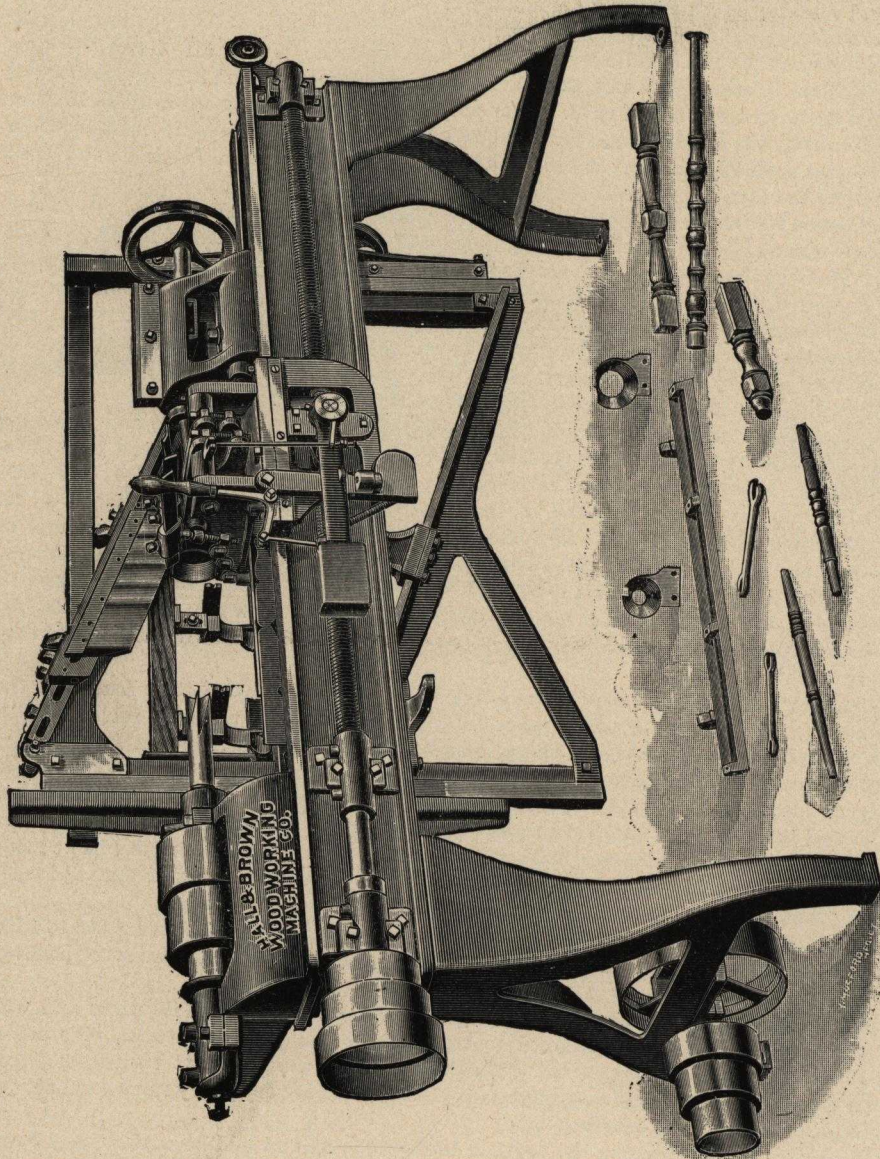
The No. 1 Lathe will turn 2,000 to 3,000 broom handles per day of 10 hours, 1,000 to 1,200 hoe handles, 400 to 500 base ball bats, 3,800 chair legs, and other articles in corresponding rapidity.

No. 3 Lathe is the same in construction as the No. 1, but heavier in all its parts and will turn up to 3 inches in diameter and designed to turn such work as peavy stocks, pike poles, horse rake heads, and similar heavy turned articles. We can furnish them to turn from 7 feet 8 inches to 20 feet. The Lathe will average per day from 300 to 400 dry peavy stocks and 200 to 300 pike poles, varying with the length.

The knives are to be ground on the bevel or hollow side and should be without any bevel whatever on the underside. The dies are right when we ship them and they should never be filed; if the knives do not cut properly the fault lies in the grinding or setting.

The tight and loose Pulleys on the No. 1 are 8 inches in diameter and 4 inches face and should make 525 revolutions per minute.

The tight and loose pulleys on the No. 2 are 10 inches in diameter and 6 inches face and should make 450 revolutions per minute.



No. 1. AUTOMATIC BACK KNIFE GAUGE LATHE.

Weight, No. 1, 30-Inch, 1400 lbs.

Weight, No. 3, 40-Inch, 2400 lbs.

Weight, No. 2, 40-Inch, 1800 lbs.

Weight, No. 2, 50-Inch, 2000 lbs.
Weight, No. 3, 50-Inch, 2700 lbs.

No. 1. Automatic Back Knife Gauge Lathe.

This Lathe takes all ordinary chair stock furniture spindles, duster and other handles, etc., from $\frac{1}{4}$ inch at smallest diameter, and 3 or 4 inches long, up to 2 inches diameter and 30 inches long, and will leave squares on $1\frac{1}{2} \times 1\frac{1}{2}$ stock.

It has two turning chisels; two speeds on the head spindle and feed; automatic stop and return of carriage; long finely fitting bearings on all moving parts; hammered crucible steel spindles and centers; patent adjustable screw tool sockets; steel feed screw with extra long patent shear nut; patent intermediate knife bed for attaching pattern knives; complete counter shaft with hangers and cone driving pulley. Cutting-off and centering attachments as ordered.

No. 2.

No. 2 size is for general work and is made either 40 inches or 50 inches between centers as ordered, and will turn stock from $\frac{1}{4}$ inch diameter up to $2\frac{1}{4}$ inches, and will leave squares on $2\frac{1}{2} \times 2\frac{1}{2}$ stock. It has three turning chisels with patent adjusting screw sockets; automatic stop and return of carriage; detachable back knife gate whereby it can be used independently as a gauge lathe; heavy deep cut steel feed screw and patent shear nut hammered steel spindle and centers; two speeds on main arbor, and three speeds on the feed, and complete counter shaft. Cutting off and centering attachments as ordered.

No. 3.

No. 3, Extra Heavy Lathe, is the only successful machine for turning table and furniture legs of all kinds with squares crib and bed posts, neck-yokes and similar heavy work, there is now in the market.

It is very heavy and substantial in all its parts, and has all the attachments and improvements suggested by long experience in manufacturing and operating this class of machines. There are four turning chisels, all with patent screw-adjusting stocks, and work from $\frac{1}{4}$ inch at smallest diameter up to 4 inches can be turned, and squares left on $3\frac{1}{2} \times 3\frac{1}{2}$ stock.

It is made either 40 inches or 50 inches long between centres, as ordered, and is a fine general tool for shops having a great variety of work, small and large.

All workmanship and materials are first-class, and the fitting is done only by careful and experienced workmen.

Tight and Loose Pulleys on counter furnished are 12 inches in diameter and $7\frac{1}{4}$ inch face, and should make 850 revolutions per minute.

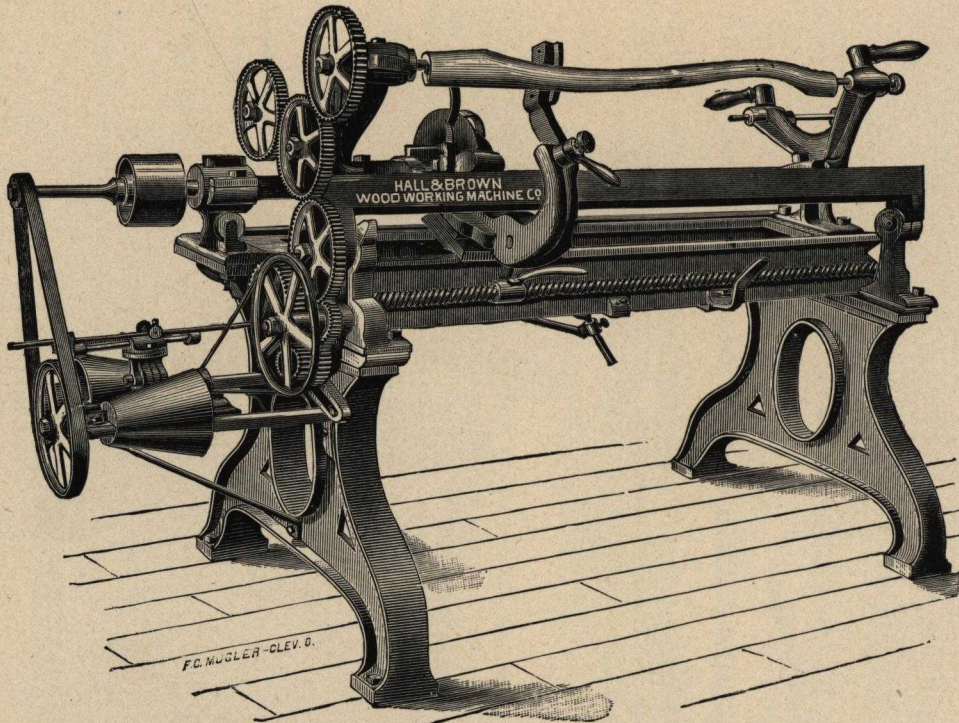
BELTS WHEN ORDERED.

Driving Belt, 7 inches wide, in length to suit from line shaft.

Spindle Belt, 6 inches wide, in length to suit from counter.

One Belt, 6 feet long 2 inches wide.

One Belt, 7 feet 9 inches long, $2\frac{1}{4}$ inches wide.



THE No. 1 OBER LATHE FOR HANDLES, SPOKES AND OTHER IRREGULAR WORK.

Weight, 1000 lbs.

This Lathe will turn Ax, Adz, Pick, Sledge. Hatchet and Hammer Handles, Spokes and Whiffletrees and other kinds of irregular handles and work.

It will turn from 27 to 30 Ax Handles, 35 to 40 Pick Handles, 140 to 160 Tack Hammer Handles, 90 to 100 Nail or Machinists' Hammer Handles, 60 to 100 Spokes per hour, and other work accordingly.

It will turn like a pattern, and can be made to turn larger or smaller by simply loosening a set nut and moving the rest toward or from the head by means of a thumb screw. The round center in the pattern is an eccentric, so that one end of the work can be made larger or smaller without changing the other end.

Wood patterns can be used, but should be made large enough to avoid springing

The feed screw and pattern can be made to revolve faster or slower while in motion, by the operator, or automatically by a trip which moves the small friction pulley between the reverse cones, giving any desired motion. The trip can be set at any point on the bed, and is operated by the carriage that carries the cutter head. It can be set to move the friction pulley the entire length of the cone pulleys, or a shorter distance, thus making a great or small difference in the speed.

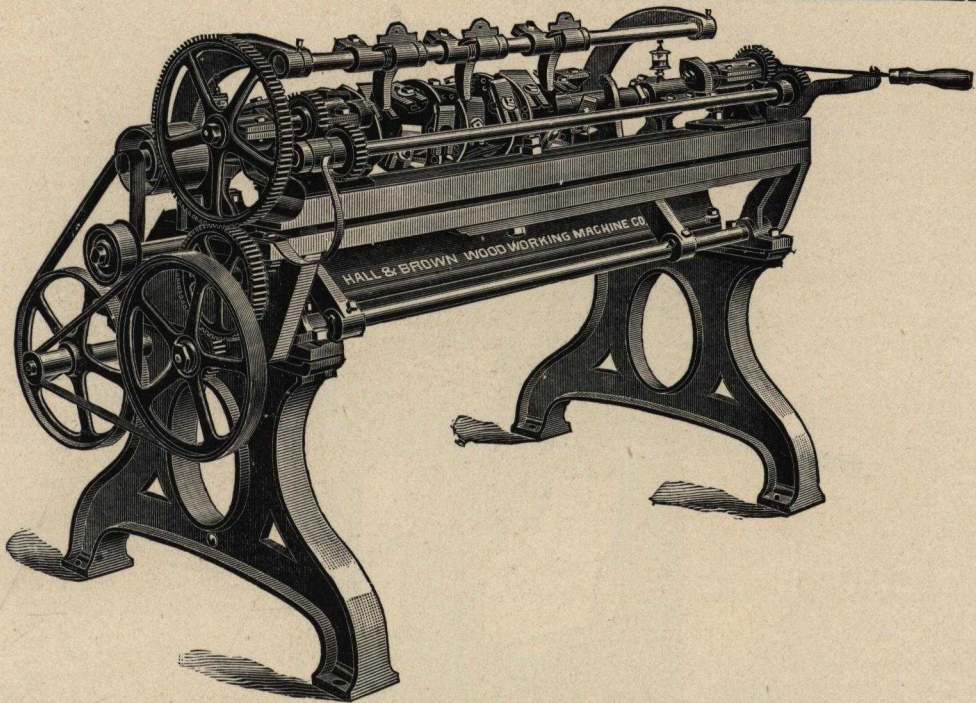
The carriage carrying the head and rest is moved forward by a screw and two-part nut, the nut being opened automatically when the work is completed, and the carriage is drawn back by a weight, at the same time placing the trip in position for the next stick to be turned.

The work is started automatically by tipping the carriage forward to turn the article, and stopped by tipping it back to take out the article when finished.

The head is so constructed that the knives will not gouge into the work nor allow sticks to get into them and break them.

The Lathe is very simple, strong and durable.

The Tight and Loose Pulleys on counter shaft are 8 inches in diameter and $4\frac{1}{2}$ inch face, and should make 875 revolutions per minute.



THE NO. 2 OBER LATHE FOR HANDLES, SPOKES AND VARIETY WORK.

Weight of 20-Inch, 600 lbs.

Weight of 42-Inch, 1600 lbs.

This Lathe will turn Hammer, Hatchet, Pick, Sledge, Auger, File, Knife, Chisel and Double Bitted Ax Handles, Whiffletrees, Yokes, Spokes, Porch Spindles, Stair Balusters, Table Legs, Chair Legs, and other kinds of handles and work.

It will turn from 200 to 300 Machinists' Hammer Handles, 125 to 150 Hatchet or Adze Eye Hammer Handles, 80 to 110 Pick or Sledge Handles, 50 to 60 Whiffletrees or Yokes per hour, and other work accordingly.

It will turn the work round, oval, square, or any number of corners, or almost any other shape the whole length at once, or it will turn one end of the work one shape and the other end an entirely different shape at the same time.

It will turn the eye of any handle to fit the tool. It will also turn Tack Hammer Handles, Whiffletrees, (either round or oval) etc., ready for the ferrule at the same time that the stick is turned.

It turns the work so smooth that but very little sanding is required.

The only patterns required are made of wood about one inch thick, the shape of the ends of the article to be turned, and are put on the centers that hold the stick. Any pattern can be made and put on the Lathe in a very few minutes, and at a trifling expense.

It is so simple that any intelligent person can run it.

It is very strong and durable. There is nothing about it that is apt to get out of order, which makes the cost of repairs very small. There has been over 42,000 Handles turned on this Lathe without grinding the knives or taking them off the heads.

It is provided with adjustable back rests, which can be made to press against the stick while being turned, which helps to keep the stick from springing.

The patterns and sticks to be turned are set in motion automatically when the carriage is tipped toward the head, and stopped when it is tipped back.

The work can be made larger or smaller by simply turning a bolt, and one end of the work can be changed without changing the other end.

The knives can be moved in any direction on the heads.

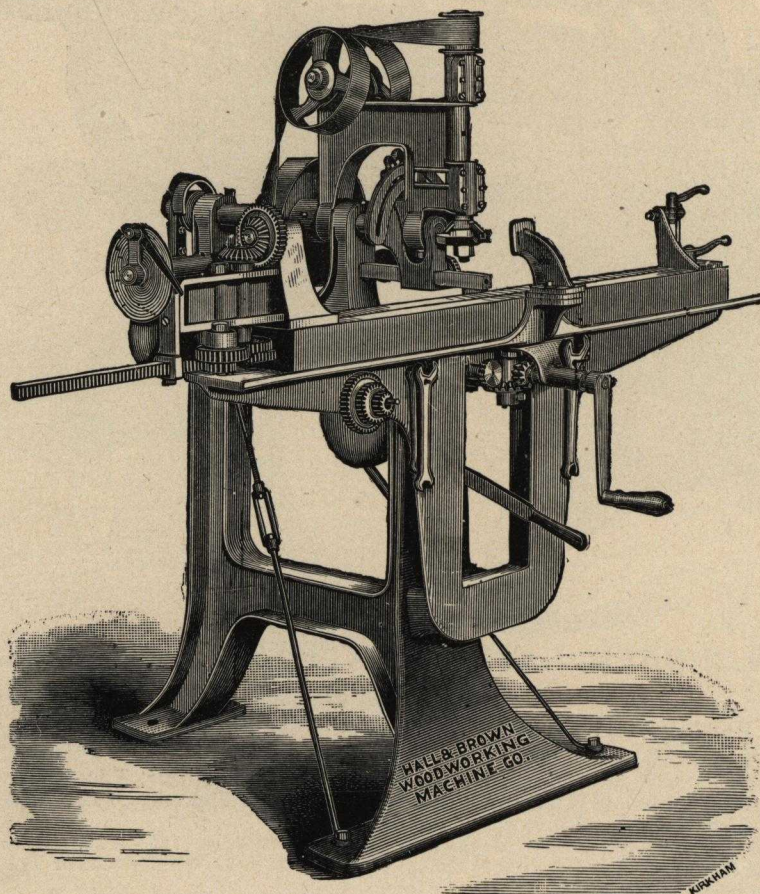
Part of the heads are provided with rings which prevents the knives from cutting too fast or gouging into the work.

Both of the centers that carry the stick to be turned are driving centers, which affords extra power for holding and turning the stick.

The Lathe is made in three sizes, one to turn 20 inches long, one to turn 30 inches long and one to turn 42 inches long. The 42 inch Lathe will turn Yokes or Whiffletrees up to 47 inches long.

The Tight and Loose Pulleys on the counter of the 20 inch Lathe are 8 inches in diameter and 4½ inch face and should make 875 revolutions per minute.

The Tight and Loose Pulleys on the 30 and 42 inch Lathes are 10 inches in diameter and 5 inch face and should make 875 revolutions per minute.

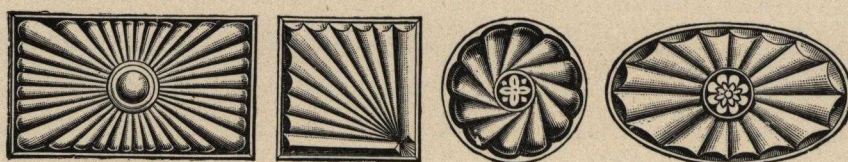
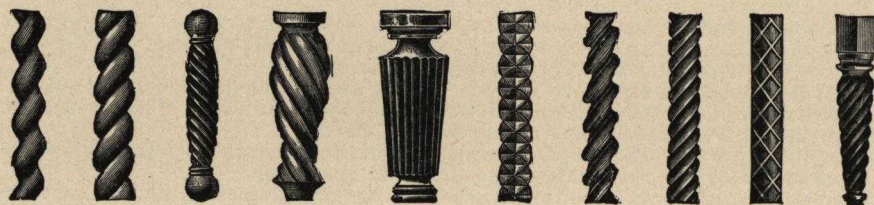


NEW PATENT FLUTING AND TWIST MACHINE.

5-Foot Machine, 1453 lbs.

6-Foot Machine, 1620 lbs.

8-Foot Machine, 1900 lbs.



Description of Fluting and Twist Machine.—Continued.

This Machine will produce all kinds of spiral or rope mouldings, either straight, tapered, curved or oval. It will make right, left and pineapple cuts, and will do straight and irregular fluting will cut from one to six threads on a piece, and will make any degree of twist, from one turn in one and one-half inches of length to one in ten and one-half inches. The cutters are similar in shape and arrangement to those used on variety shapers, and are made of the same steel. They are held between collars that are somewhat similar, but so arranged that the knives have a peculiar action, cutting from the outside in, and making a smooth cut, even against the grain. They revolve always in the same direction, whether the twist be right or left, and one set will produce several different shapes of work. Changing from one degree of twist to another, or from right to left, takes less than one minute. This Machine will swing eight to twelve inches, and will take five to ten feet between centers, according to length ordered.

A Medallion Fluting Attachment will produce radial fluting on flat work up to 9 inches square, or 6x12 oblong. This fluting can be either perfectly flat or can be swelled or waved. It can run direct to the center or tangent to a central circle.

The same cutters are used as for the twist work.

The following sizes are now made: 5 foot machine to swing 8 inches. 6 foot machine to swing 8 inches. 8 foot machine to swing 8 inches. 8 foot machine to swing 12 inches. 10 foot machine to swing 12 inches. **Directions for Setting Up and Running.**

The countershaft should be placed directly over the Machine, and should make 480 turns per minute.

TO MAKE CUTTERS.

Take a wooden block, either $1\frac{5}{8}$ or two inches thick, and $5\frac{1}{2}$ inches diameter. Turn it to the shape the cutter is to produce, and cut a notch in it so that the cutter can lie in it exactly the same position as when between the collars. Grind one cutter so that when laid in the notch, its cutting edge fits the edge of the block. Make the other cutters to match, two right and two left. Be sure to grind the back of the cutting edge away enough to clear, so that it will not strike the work and burn.

TO MAKE STRAIGHT TWISTS.

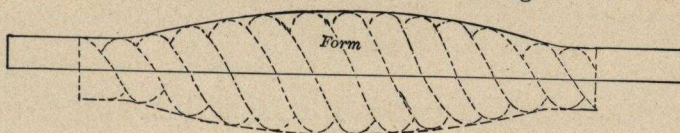
Let the roll under the cutters work against the edge of the shears. Lift the cutter away by the lever when the cut is finished. Regulate the depth of cut by setting the roll forward or back. Always work the cut towards the head stock.

TO MAKE TAPERED STOCK.

Let the roll work against a wedged-shaped wooden form laid against the edge of the shears, and held by the thumb screw in the foot of the head stock. Swing the bed around and secure it by the set screws at the side of the bevel gears.

TO MAKE CURVED WORK.

Let the roll under the cutters work against a wooden form laid against the edge of the shears, and held by the thumb screw in the foot of the head-stock. This form must have the same outline as the finished work would have if cut in two through the middle, thus:



Place underneath this form, in place in the machine, a board of an inch thick, about 10 inches wide and 4 feet long, removing the left-hand roll. Swing the bed around so that the part of this form just opposite the roll is square with the bar that holds the roll. Mark on the board, with a pencil, around the boss where the left hand roll belongs. Move the shears along an inch or so, and repeat the operation, taking care to keep the part of the form opposite the roll square with the bar. Mark the whole length in this way, remove, trace a curve touching all these lines, saw out on a band saw, replace in the machine and it is ready for work. While the twist is being cut keep this lower form against the left hand roll, and let the upper form push the cutter back the same as for tapered work.

TO TWIST VERY SMALL STICKS.

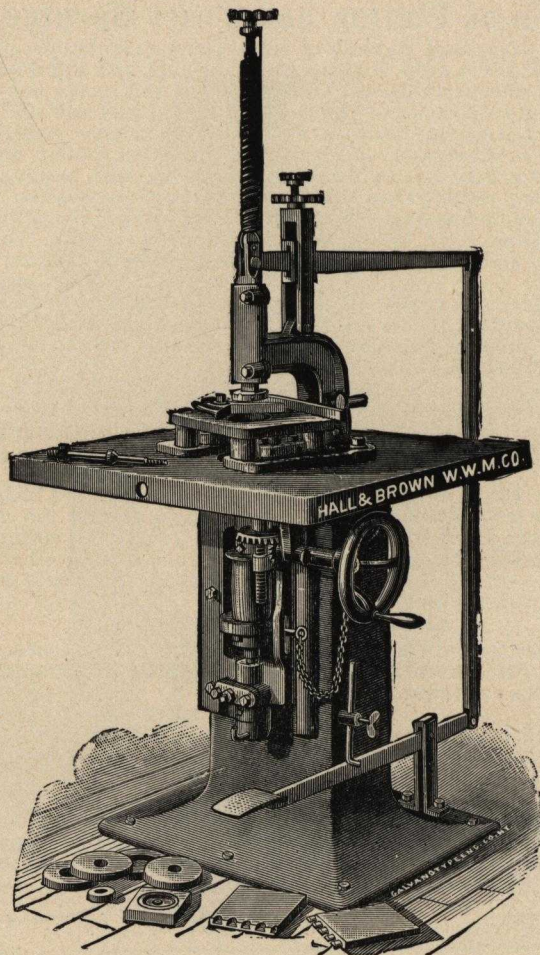
Screw to the bracket opposite the cutters a wooden block with a hole through it, fitting the stick to be twisted. Take off the tail stock and pass the stick through the block and into a hand wood bush fitted in place of the spur center. Clamp it there by the same screw used for the spur center.

The cutter will cut its own opening through the block to the stick. We can furnish to order, for this work, a chuck holding from $\frac{3}{8}$ to 2 inches square.

Twenty different degrees of twist, varying from one turn in $1\frac{1}{2}$ inches of length to one in $10\frac{1}{2}$ inches, are made by changing two wheels on a single screw, according to a table attached to the machine. Right or left is produced by placing these gears on the one or the other side of a rack.

When no particular shape of knife is called for we use our own judgment as to what we will send with the machine. All knives are numbered and can be duplicated, but the safest way is to mark the exact shape on a piece of paper and send to us, as the knife may have been changed from its original shape. Or, what is better yet, send a sample of the work to be made.

Tight and Loose Pulleys on counter shaft, furnished, are 10 inches in diameter and $3\frac{1}{2}$ inch face and should make 480 revolutions per minute.



CORNER BLOCK MACHINE.

Weight, 925 lbs.

This Machine will produce from fifteen to twenty corner-blocks or rosettes per minute, and will use cutters up to $4\frac{1}{4}$ inches diameter. The blocks, however, may be six inches square or over.

Adjustable gauges are provided for holding the blocks central or for guiding long strips that are to have rosettes cut at intervals. The best way to make detached rosettes is to cut them almost through long strips and then pass the strips through a planer, to remove the part left standing by the rosette cutter. The Machine, however, is provided with an attachment for making the rosette complete in one operation. This attachment consists of a chuck holding a wooden block, into which spurs are driven. These spurs become imbedded in the back of the rosette and lift it off the cutters at the end of the cut. Another blank is then placed in position to cover the cutters, and the rosette removed from the spurs.

If the stock is dry enough the work turned out will be so smooth as not to require sand-papering. To produce the best results it should be kiln-dried. Waste pieces of all kinds can be collected, put in the steam box or near the boiler, thoroughly dried, passed through the planer, sawed up, and turned into rosette or corner blocks, thus utilizing what would otherwise be of no value.

When the Machine is to be used for moulding, it is furnished with an extension for the spindle, collars for the extension, and reducing rings for the hole in the table.

When moulding is to be done it is not necessary to remove the upper works, but simply to slide them back out of the way.

Tight and Loose Pulleys on counter shaft furnished are 9 inches in diameter and 4 inch face and should make 1050 revolutions per minute.

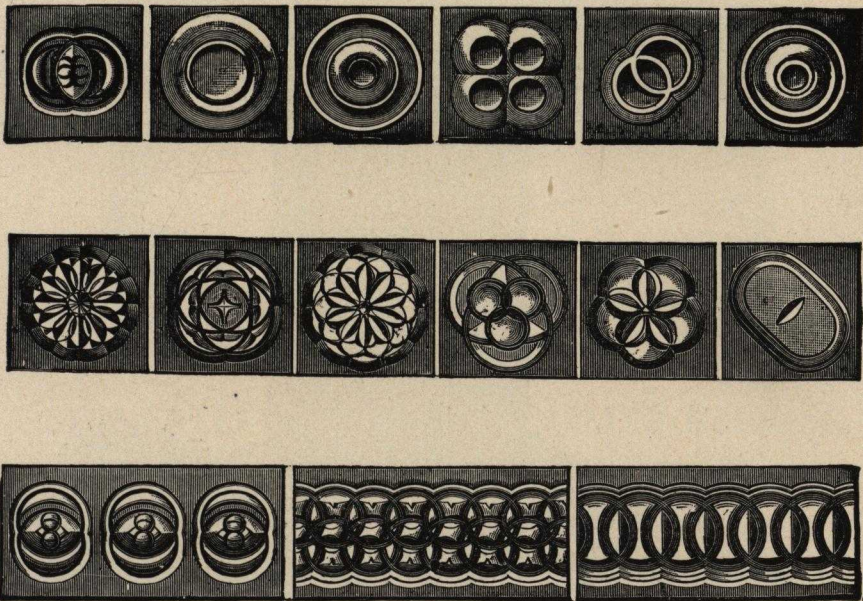
Description of Corner Block Machine.—Continued.

The spindle bearings are arranged so that the oil cannot escape, but is used over and over again, maintaining the most perfect lubrication, and enabling the spindle to run at a high rate of speed.

The spindle pulley is $3\frac{1}{2}$ inches diameter, $5\frac{1}{2}$ inches face, and should make about 6,000 turns per minute.

In ordering, state for what kinds of work the machine is to be arranged.

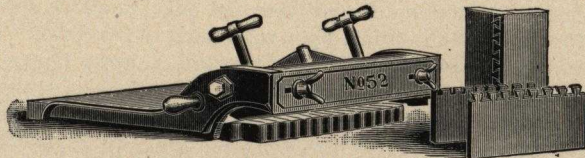
Horse-power required, 3 to 4, according to the work.



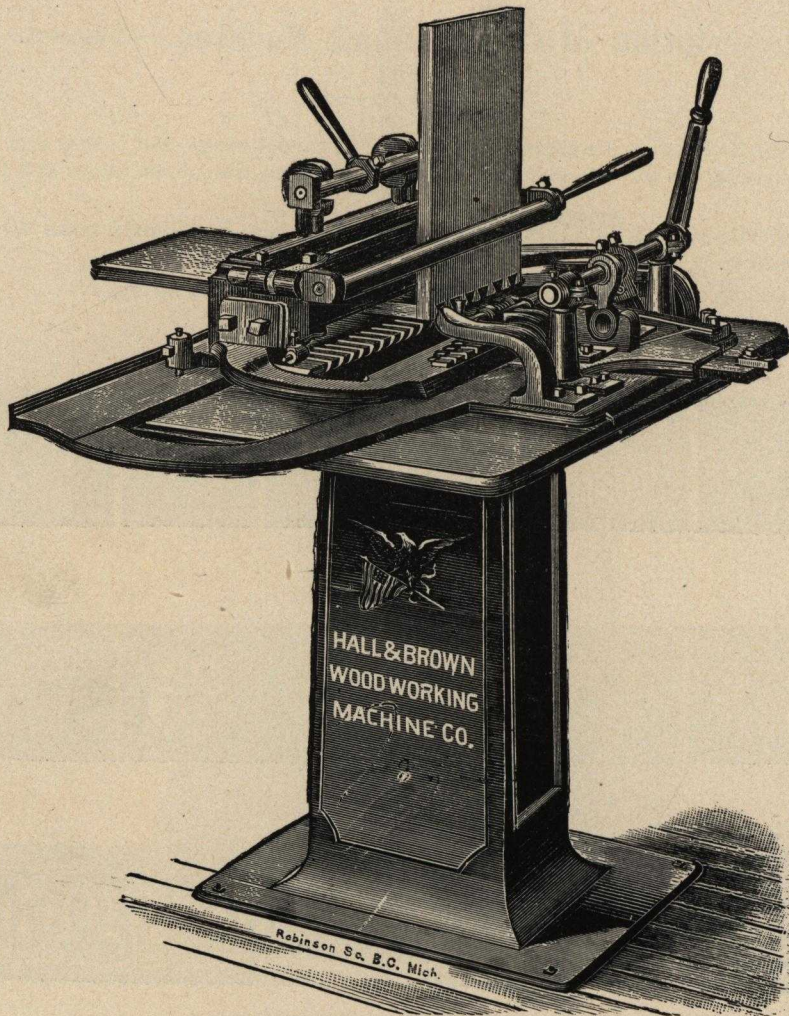
Samples of Work done on this Machine.

For dove-tailing, the machine is furnished with the following;

IMPROVED DOVE-TAILING ATTACHMENT.



To use this attachment it is only necessary to lay it loose on the table of the machine, and, after placing the stock on it, bring the form in contact with the collar on the cutter-head, by guiding it around which it will produce a perfect dove-tail and in the hands of any ordinary mechanic will rapidly execute the finest work, making a blind dove-tail and finishing both parts of the one joint in one operation.



INDEPENDENT DOVETAILER.

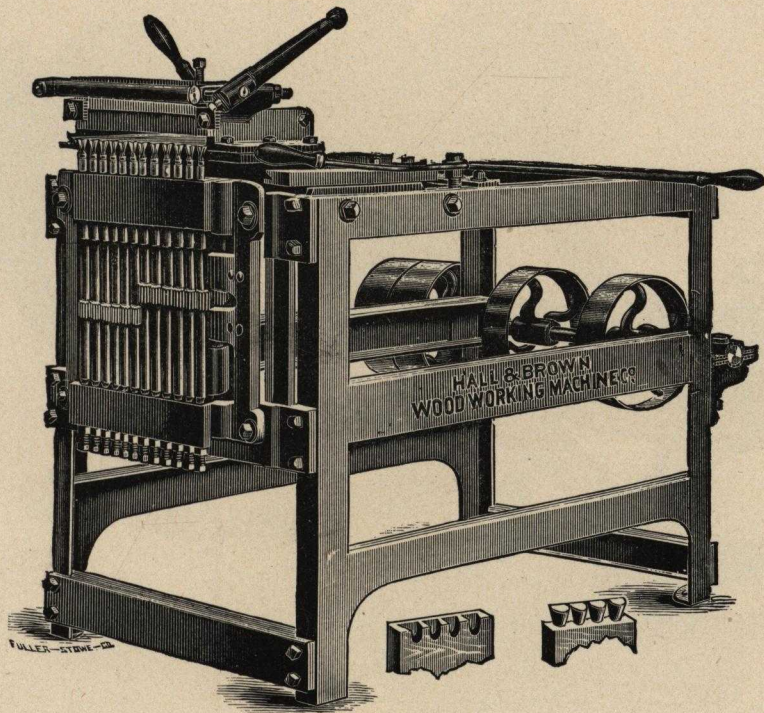
Weight, 700 lbs.

The Dovetailer as shown above, is a standard dovetailer.

The frame is of one solid casting, the top is of iron, planed smooth and true—thirty inches square, affording sufficient table room for a shaper and edge moulder for small shops. The spindle is erected in the center of the trunk, upon solid parts of the same. The upper journal runs in a babbitted box. The lower journal runs through a brass sleeve and rests upon a tempered steel pivot and has an oil supply. It has a screw hand wheel at the bottom for adjustment up or down. The cutter is held by a short steel chuck attached to the spindle by a taper fit, so that it will never get loose or out of line, and can readily be replaced when worn. The spindle will also receive our stem chuck for holding our solid cutters, or flat knives for edge moulding or shaping,

It will cut both front and side of drawer at one time, and, if narrow, two fronts and two sides at one time. It dovetails with equal facility on any thickness from $\frac{1}{4}$ to $1\frac{1}{2}$ inches, and up to 13 inches in thickness.

The Tight and Loose Pulleys are 9 inch diameter and 4 inch face, and should make 760 revolutions per minute.



NEW PATENT GANG DOVE-TAILING MACHINE.

Weight, 900 lbs.

The cut here shown represents a new Dovetailing Machine, which has the advantage of completing a corner to a drawer (front and side) at one operation, cutting the tenons so that they will fit mortices without leaving any cavity, making as complete a joint as on hand work, any width up to eleven inches. Spindles are made of steel and run in separate boxes, each adjustable for wear. Spindles are driven by cut gear, and six spindles are connected together, so that either set can be driven independently of the other if desired—it being really two 6-spindle machine—which can be used together or singly. Carriage is operated by a double lever, and can be operated with ease.

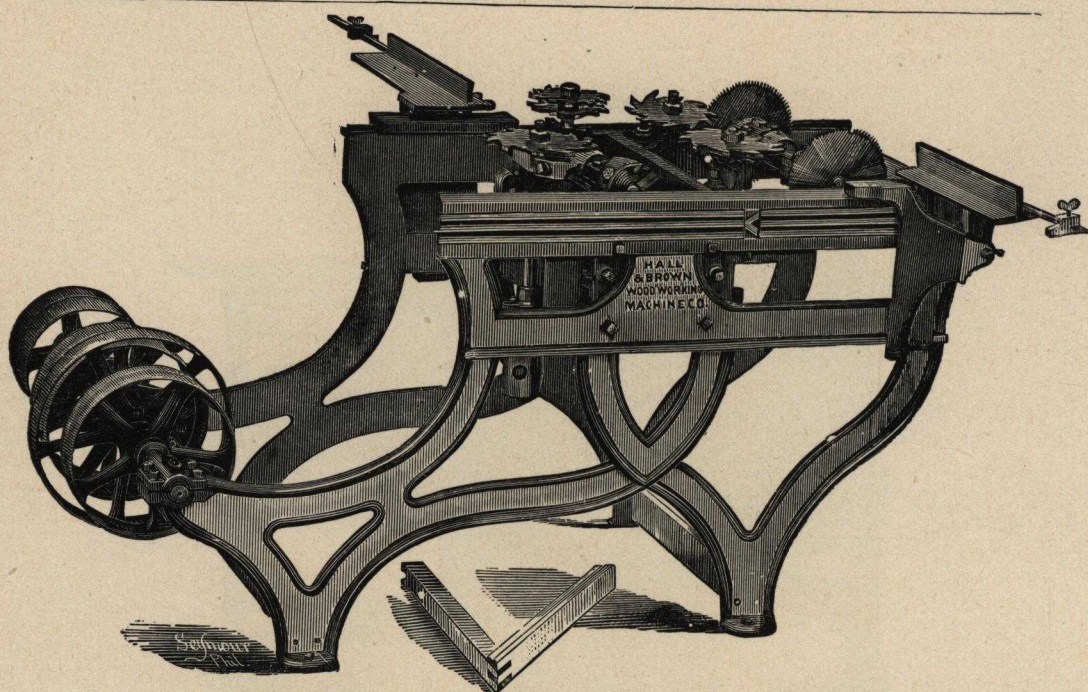
We can also furnish single nine spindle machine that will do the same work, but works up eight inches wide only.

Counter shaft has tight and loose pulleys ten inches in diameter and five inch face and should make 700 revolutions per minute.

BELTS WHEN ORDERED.

Driving belt in length to suit from line shaft.

Two belts eleven feet and ten inches long, two and one-quarter inches wide.



IMPROVED PATENT SASH DOVE-TAILING MACHINE.

Weight, 800 lbs.

The formation of the dovetail mortises, on the stiles and tenons on the check rails of sash have heretofore been the most tedious and expensive parts of sash making, requiring skilled labor, and the use of at least four different machines, as well as from six to ten times handling the material to accomplish the purpose. In fact, no machine has ever been made and sold to supply this want, each sash maker using some rude construction in connection with the saws, mortisers, tenoners, &c., in his factory that are designed for other work.

The above cut represents our Improved Sash Dove-tailing Machine to which we would call the especial attention of sash manufacturers, it being the only machine in the market that forms the dovetail complete on check rail sash at one operation. It is fitted on one side with a sliding table (which is adjustable), for different thicknesses of lumber, and two upright adjustable mandrels, which carry heavy saws of the proper shape to complete the dovetail at once passing through. The other side is fitted with a sliding table and three mandrels, two upright and one horizontal, which carry saws and cutters suitable to form the tenon on the check at one operation.

It is also fitted with a cross-cut saw on each side, to cut the lumber to the desired length before passing through the cutters. With this improvement the work is all done on one machine, at one operation, and more perfectly than is possible by any other method ever employed. An ordinary hand can make at least ten dovetail mortises or tenons per minute, or the joints for 750 windows per day, being the work of some twenty skilled men.

We claim that this machine is superior to all others in the following particulars:

First.—It is the only machine in the market that completes the dovetailing of check sash without adjustment or change.

Second.—With it an ordinary laboring man can do the work of twenty skilled workmen.

Third.—It does the work much more accurately than can be done by hand or with any other machine, thereby securing great strength and stiffness.

Fourth.—It does its work so accurately that the work can be made in stock and laid away until wanted, with absolute certainty that it will come together all right.

Fifth.—The shoulder formed on the check rail makes the sash much stiffer than the old mode.

Tight and loose pulleys are 9 inches in diameter and $3\frac{1}{2}$ inches face and should make 650 revolutions per minute.

BELTS WHEN ORDERED.

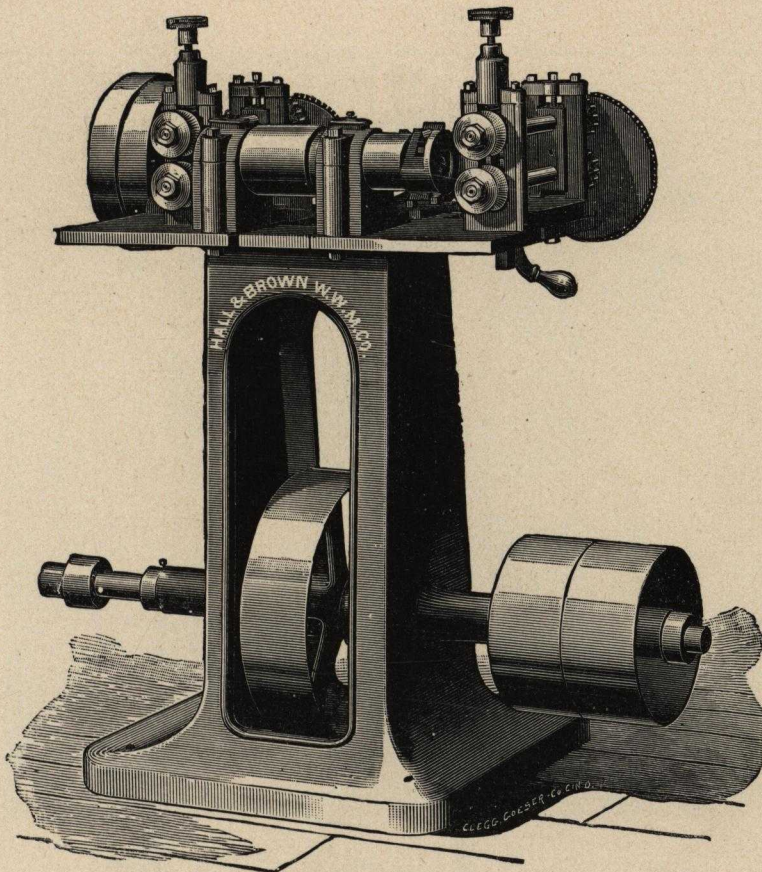
Driving Belt four inches wide, in length to suit from line shaft.

Two belts 10 feet 10 inches long, 3 inches wide. One belt 13 feet long, 2 inches wide.

One belt 9 feet 5 inches long, 3 inches wide.

One belt 9 feet 11 inches long, 2 inches wide.

One belt 8 feet 2 inches long, 3 inches wide.



POWER FEED ROD MACHINE.

Weight, 800 lbs.

Our Power Feed Rod Machine for making rods, pins and dowels is a compact and solidly-built machine. It will be found very convenient and reliable for use in furniture factories, planing mills, handle and chair factories, and other establishments requiring a machine of this class.

The iron frame is cast in one solid cored piece, and occupies but little floor space; it has a broad base, giving it a firm and solid bearing on the floor.

The feed is very powerful, consisting of four geared feeding rolls, the first two feeding in the square stock, and the last two feeding out the finished rod; the first have angles in their faces to hold the rough stock, and the latter a groove to suit the finished stock. The feeding-in rolls are given tension by springs, so as to conform to any inequalities of the stock, and are pivoted so they can be quickly swung out of the way when a change of chucks or heads is desired.

The mandrel is hollow, made of the best material, and has a large pulley running between long bearings, giving ample belt power for turning either green or dry stock. Each machine is furnished with one head, any size within its capacity.

Three sizes are built: No 1, to cut from $\frac{1}{4}$ inch to $\frac{3}{4}$ inch;
No. 2, to cut from $\frac{1}{4}$ inch to $1\frac{1}{8}$ inch;
No. 3, to cut from $\frac{1}{4}$ inch to 2 inch.

A special head is required with rolls for each side of rod, and the head can be instantly removed and replaced by another size.

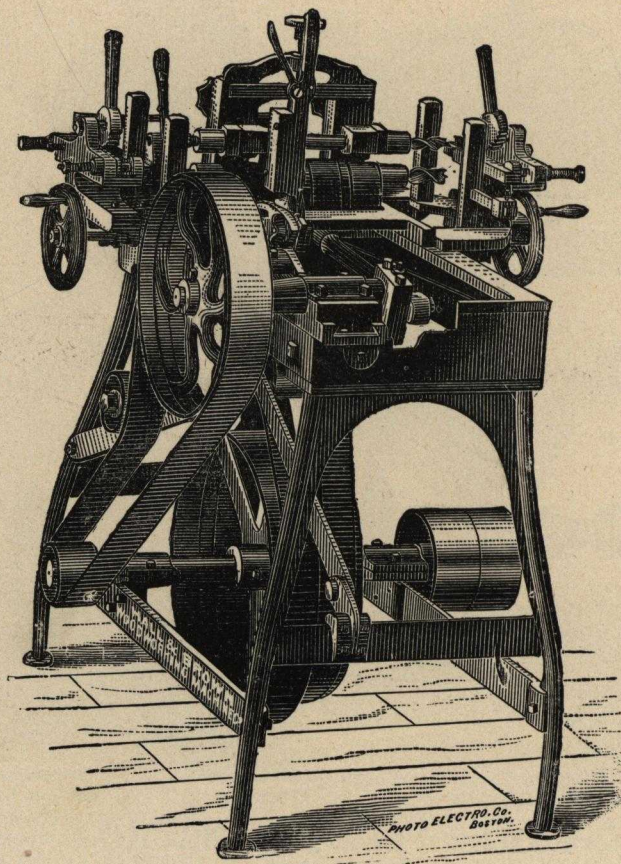
The Tight and Loose Pulleys are 10 inches in diameter and 4 inch face and should make 750 revolutions per minute.

BELTS WHEN ORDERED.

Driving belt in length to suit from line shaft.

One Mandrel Belt 7 feet $4\frac{1}{2}$ inches long, 4 inches wide.

One Feed Belt 6 feet 5 inches long, 2 inches wide.



ENTERPRISE PULLEY MORTISER.

Weight, 700 lbs.

The above machine is in use in nearly every state and it is less than seven years since it was first introduced to the trade which is conclusive evidence in itself that it possesses all we claim for it; it will accomplish more than any other in use and is built strong in all its parts and requires the services of but one person to operate it.

Four mortises are made at one operation.

No hand work is required after leaving the Machine.

Easily operated and speedily adjusted.

Skilled labor is not requisite as any boy can operate the Machine.

The round end Pulleys merit their popularity, for they are systematically formed, well constructed and attractive in appearance: they are cheaper than all other Machine Mortised Pulleys in the market and equal in merit to any.

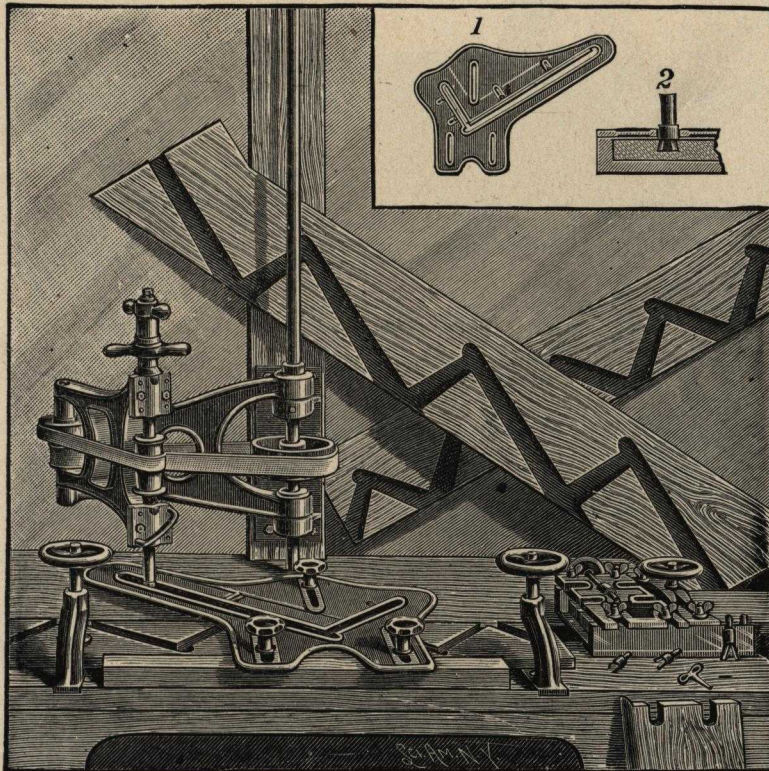
We can furnish three different sizes of bits, viz: 1-inch, 1½, or 1¾, but furnish one set only with each machine to be selected by the purchasers.

The Tight and Loose Pulleys are 7 inches in diameter and 3 inch face and should make 850 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt in length to suit from line shaft.

One Belt, 7 feet 6 inches long, 2½ inches wide.



STAIR ROUTER.

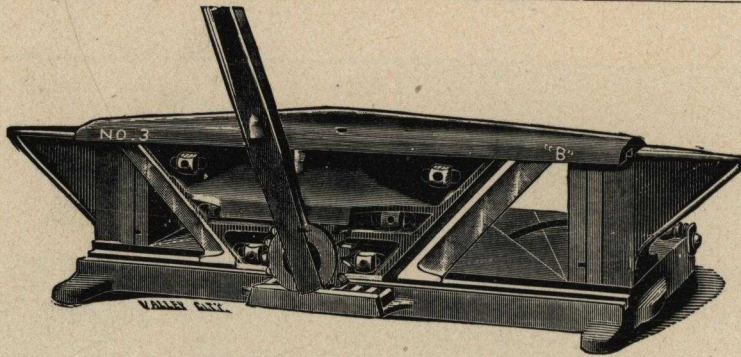
Weight, 350 lbs.

This machine has been especially designed for stair-builders' use in gaining the wall string to let in the threads and risers, and for dove-tailing the threads to receive the balusters. In laying out the wall string it is only necessary to lay off the face lines, as the templet shown in Fig. 1 can be set to allow for any size of wedge the stair builder may wish to use. When it is necessary to gain the strings and allow no wedge room, the templet can be set to the thickness of the threads and risers, and they can be drove in and make good work without wedges. This templet is adapted to work any length of thread, either right or left hand, winders included, and when once set need not be changed again for any number of strings of that rise and thread, as the work is run under the templet and firmly held by two clamps while a thread and riser are being worked. The machine is provided with two bits, shown in Fig. 2, which work as well on hard as on soft wood. With this machine a string with 6 or 18 risers can be routed inside of fifteen minutes, while the cutters do not knock off the finished corners, which the stairbuilder finds it difficult to keep perfect when routing out by hand. The spindle is so arranged that all lost motion is taken up by two check nuts at the top of the spindle.

This machine may also be used for sinking and raising panels, gaining window sills and jambs—letting in sash pulleys and different sized rosettes; also as a sand-paperer. The machine has been planned to take up as little room in the shop as possible. The machine can be bolted to the side of the wall or against a post in the centre of the shop, can be run from the line of shafting on the same floor, or by a line of shafting on the ceiling below, as the tight and loose pulleys can be placed above the machine, or under the floor below the machine. The bench may be built 5 or 6 feet long and about 3 feet wide. The machine is furnished with 8-inch tight and loose pulleys, with 4-inch face, and should run about 1,000 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 4 inches wide, in length to suit from line shaft.
 One Belt, 5 feet 8 inches long, 2 inches wide. One Belt, 4 feet 3 inches long, 2½ inches wide.



UNIVERSAL TRIMMER.

Cut Showing Front View of the No. 3 B.

The bed is strongly ribbed, of ample thickness, sets low on the bench, Making it more convenient to handle.

The stops are provided at each end of the bed which limits the motion of lever and prevents the gear moving too far and coming out of the rack.

The motion is imparted to the carriage by means of a loose pinion, rolling between the two racks.

One inch travel of pinion gives two inches motion of Carriage.

The lever and pinion are steel castings, no liability of breakage. Admitting of a powerful leverage, which is equal in all parts of the stroke.

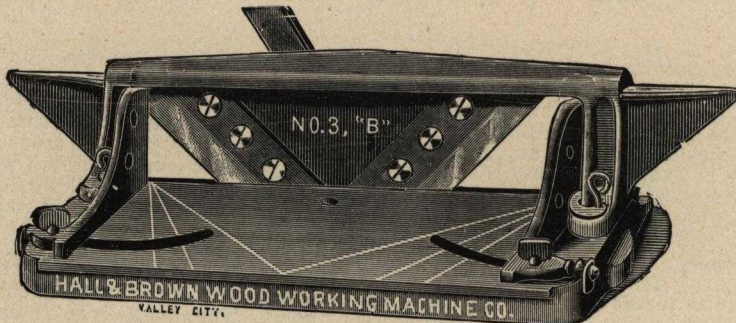
The carriage has very long bearing both top and bottom.

Is made very stiff by the rack and ribs extending across the face, has oil chamber both top and bottom with connecting passage, insuring complete lubrication, making a durable machine. Oiling through the one hole in the frame reaches all the wearing parts.

Our gauge is firmly supported against the planed upright frame, (this frames makes a shear cut with the knife when the gauge is removed). Cannot be sprung or broken. Is adjusted or held in any position in the curved slot, being guided by the circle at the top, or the link at the bottom.

It has an adjustable stop on the square line.

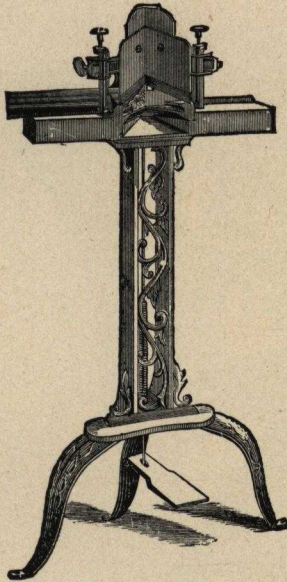
We get the draw cut by inclining the knife at an angle of 45 degrees. This gives $1\frac{1}{2}$ inches of cutting edge on the knife for each one inch in height it has to cut, the line of motion being parallel to the bed. A shear cut by having gauge work close to the knife.



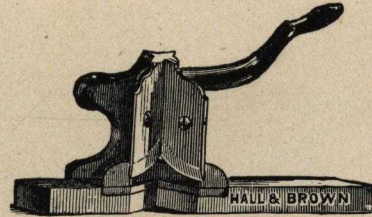
Back View of No. 3 B.

We can furnish these Trimmers in the following sizes.

No. of Machine.	Length of Stroke.	Rise.	Size of Bed.	Shipping Weight.	Legs.
3-B	6-inch.	3-inch.	6 x 15	25 lbs.	Without.
4-A	8 "	4 "	8 x 17	30 "	"
4-B	8 "	4 "	8 x 20	45 "	"
4-C	8 "	4 "	8 x 20	45 "	"
4-D	8 "	4 "	12 x 20	110 "	With.
6-A	12 "	4 "	13 x 27	135 "	"
6-D	12 "	4 "	18 x 30	300 "	"

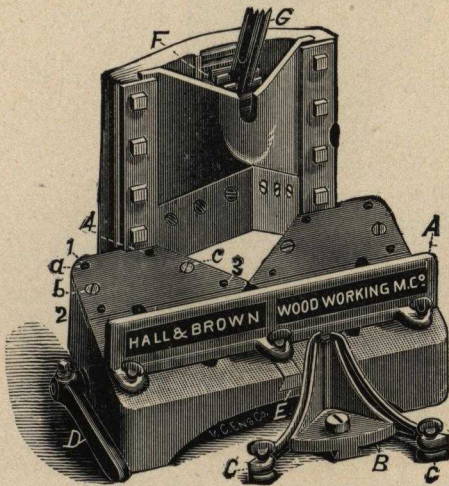


No. 1. FOOT MITRE.

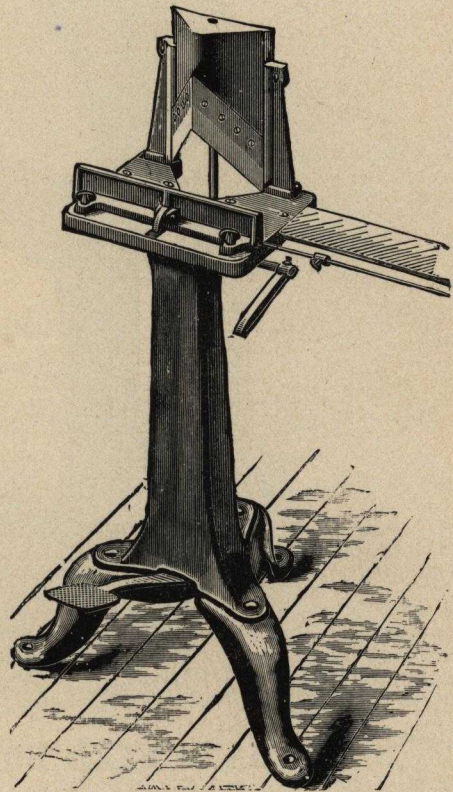


No. 1. HAND MITRE.

These Machines are intended for carpenters and others using plain mouldings.



No. 2. IMPROVED HAND MITRE.

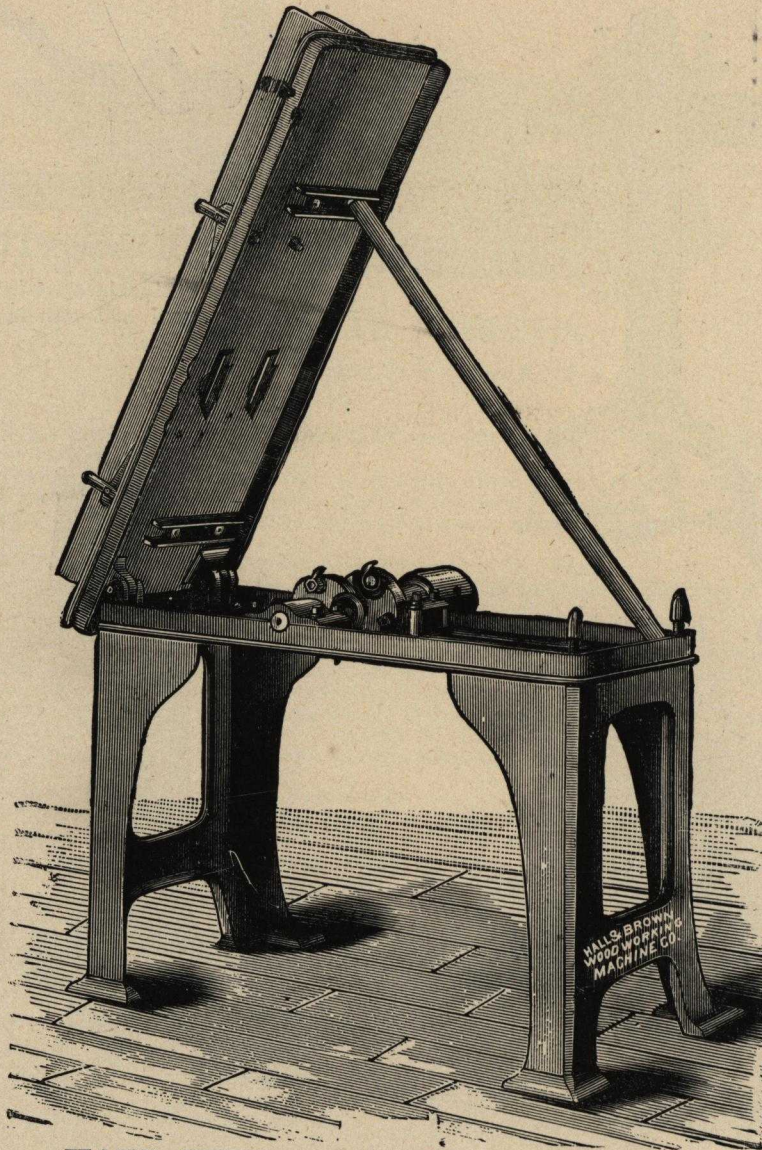


No. 2. IMPROVED FOOT MITRE.

We can furnish the following sizes:

- No. 1, Hand Mitre, cuts up to 2½ inches wide, weight, 20 lbs.
- No. 1, Hand Mitre, cuts up to 3 inches wide, weight, 20 lbs.
- No. 1, Foot Mitre, cuts up to 2½ inches wide, weight, 60 lbs.
- No. 1, Foot Mitre, cuts up to 3 inches wide, weight, 90 lbs.
- No. 1, Foot Mitre, cuts up to 4 inches wide, weight, 120 lbs.
- No. 2, Improved Hand Mitre, cuts up to 2 inches wide, weight, 25 lbs.
- No. 2, Improved Hand Mitre, cuts up to 4 inches wide, weight, 150 lbs.
- No. 2, Improved Foot Mitre, cuts up to 3 inches wide, weight, 140 lbs.
- No. 2, Improved Foot Mitre, cuts up to 5 inches wide, weight 250 lbs.

Back support for rabbitted moulding, extra when ordered.



HAND FEED BOX BOARD MATCHER.

Weight, 300 lbs.

This Machine has been introduced to meet the increasing demand for a cheap Hand Feed Box Board Matcher, and by referring to the cut a description is almost unnecessary.

One set of the celebrated Shimer Matcher Heads and Bits are furnished with each Machine.

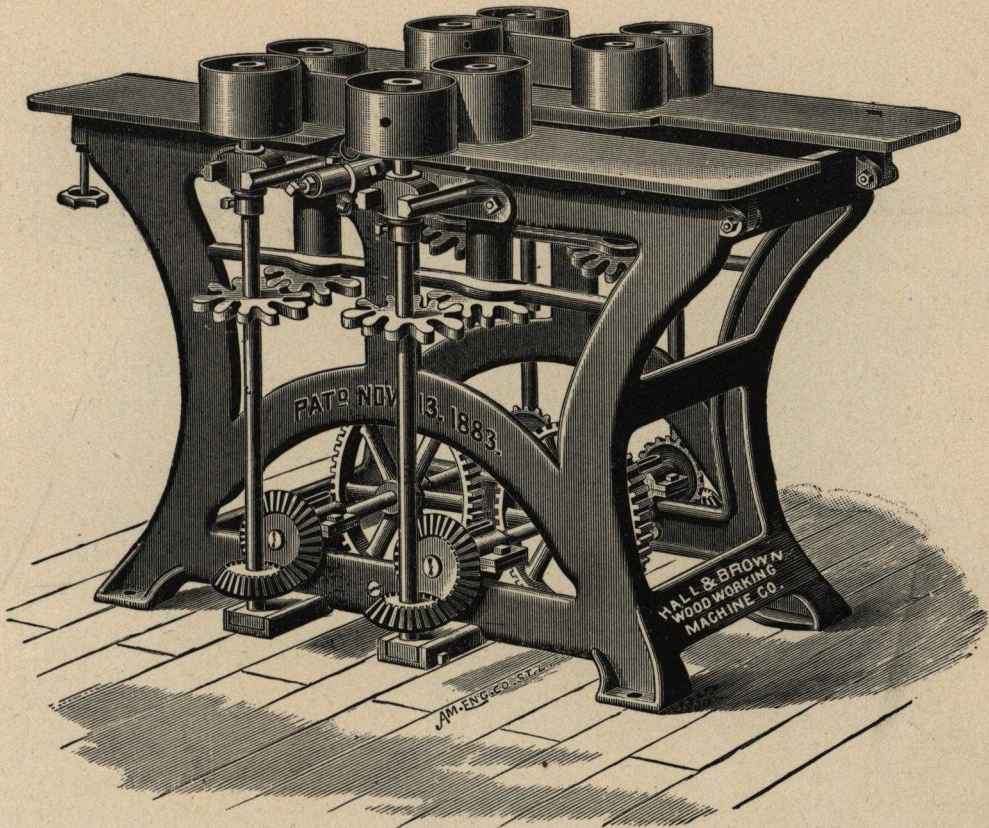
The Machine is complete in every particular, convenient and durable.

The Matcher Head Shaft is made of the best quality of steel and runs in boxes lined with the best genuine babbitt metal.

The Machine as shown in cut is represented with the table elevated so that free access can be had to the heads and bits.

The Pulley on the Matcher Spindle is 4 inches in diameter and 4 inch face and should make 3,500 revolutions per minute.

When counter-shaft is ordered unless otherwise advised it will be furnished with Tight and Loose Pulleys, 10 inches in diameter and 5 inch face and with 20 inch driver and should make 750 revolutions per minute.



No. 1. POWER FEED BOX BOARD MATCHER.

Weight, 1100 lbs.

This new and improved Box Board Matcher has been designed expressly for tonguing and grooving Box Boards after being dressed and cut to the desired length.

It is simple in construction and provided with a strong and powerful feed, and will do rapid and perfect work without tearing cross-grained material and by its continuous feed the operator can accomplish twice the amount and with less labor than can be done on a hand feed Machine.

The cut represents the Machine as having but four driven feed rolls upon each side, while as we now build the Machine it is provided with five driven rolls upon each side, thereby enabling the operator to work material as short as 8 inches, perfectly accurate, by being held firmly to the bed and against the bits. The material in passing through the rolls, is at all times firmly held against the bed and guide regardless of length or width thus insuring a perfect joint and even face.

The Matcher Head Mandrel is double end, of large size, made of the best quality of steel, which runs in long boxes lined with the best genuine babbitt metal.

We furnish with each Machine one set of the celebrated Shimer Heads and Bits for tongue and groove, the tongue head working upon one end of the Mandrel and the grooving head upon the opposite end, the belt pulley being placed in the center between the boxes; the operator has free access to the heads as they can be readily removed and replaced without the least re-adjustment of the Machine.

The inside rolls are stationary, the outside rolls being adjustable to suit the different thicknesses of material to be matched.

The rear tables have a separate adjustment to receive and support the board after the cut has been taken.

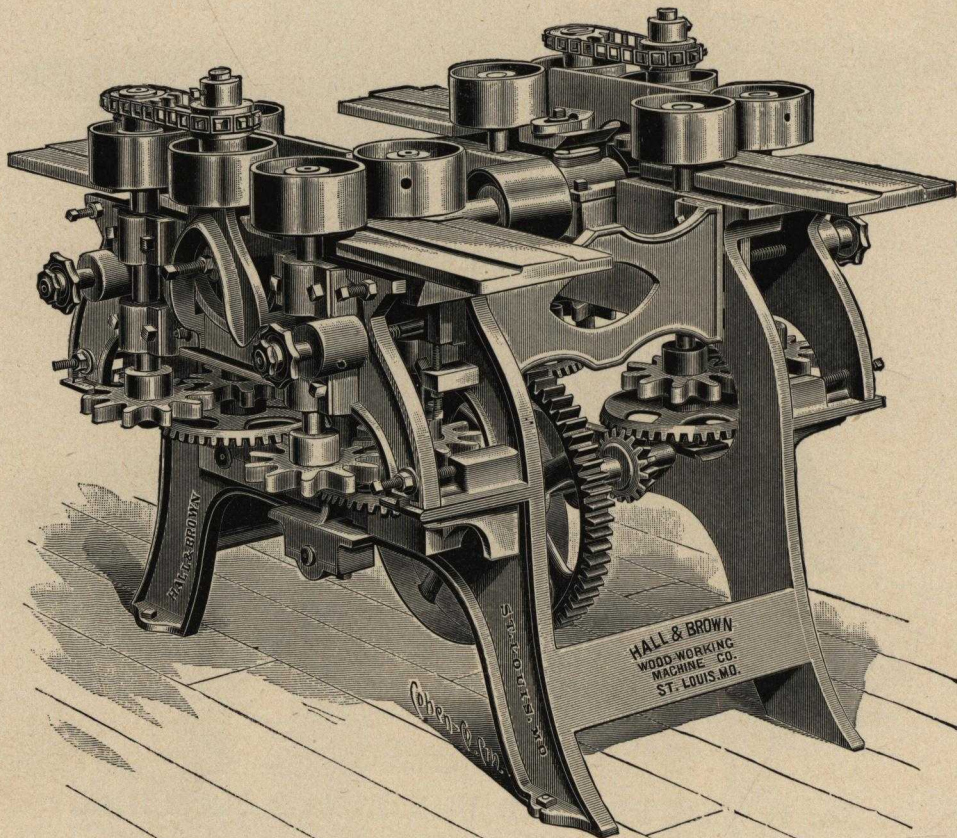
We furnish the Machine complete with counter shaft; the Tight and Loose Pulleys are 10 inches in diameter and $6\frac{1}{2}$ inch face, and should make 650 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 5 inches wide, in length to suit from line shaft.

One Matcher Head Belt, $4\frac{1}{2}$ inches wide, in length to suit from counter.

One Feed Belt, 3 inches wide, in length to suit from counter.



No. 2. POWER FEED BOX BOARD MATCHER.

Weight, 1150 lbs.

This machine is somewhat different from the one illustrated on the preceding page; it is a rapid, perfect and complete Machine for the purpose it is intended, and will do two or three times the amount of work with the same labor as can be done on any hand Machine in use. It is provided with a strong and powerful feed consisting of five driven rolls upon each side, the tongue being worked upon one side of the Machine, and the groove upon the opposite side. It will work material as short as 8 inches. The Material in passing through the rolls is at all times held firmly against the bed and guide regardless of its length or width, thus insuring a perfect joint and even face. The Machine is especially adapted to the wants of large manufacturers, who in view of the sharp competition in the box trade desire to avail themselves of every advantage to lessen the cost of their product, and the amount of labor on same. It is simple in construction, easily handled and adjustable in all its parts.

We furnish with each Machine one set of the celebrated Shimer Matcher Heads which absolutely prevents any tearing in cross-grained stuff and enables it to make a joint that is smooth and even and a feed far more rapid and continuous than can possibly be obtained by hand.

We also furnish counter shaft with Machine, not shown in cut.

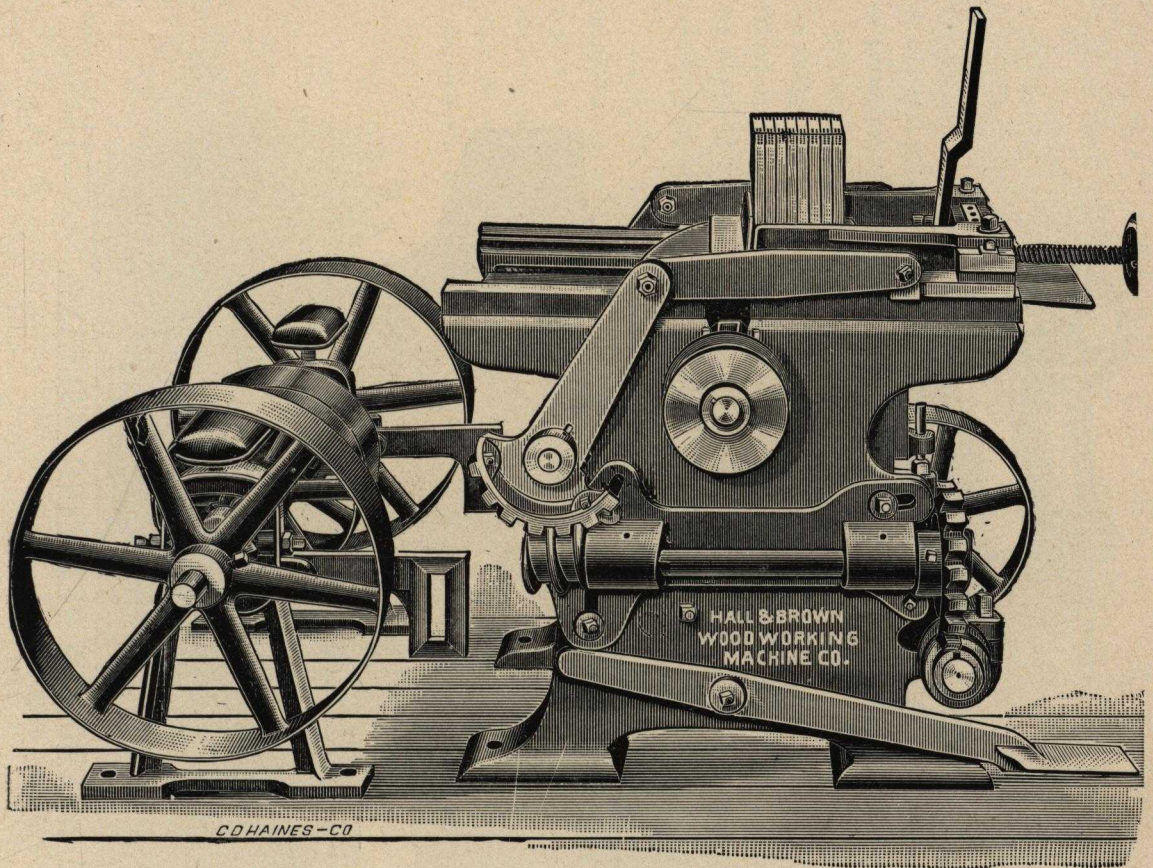
The Tight and Loose Pulleys which are 10 inches in diameter and $6\frac{1}{2}$ inch face, should make 650 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt 5 inches wide, in length to suit from line shaft.

One Matcher Head Belt, $4\frac{1}{2}$ inches wide in length to suit from counter.

One Feed Belt, 3 inches wide, in length to suit from counter.



AUTOMATIC BOX CORNER LOCK MACHINE.

Weight, 1500 lbs.

This machine is intended to tenon box stuff, and for other purposes where a strong corner is required. Being automatic it is capable of doing a large quantity of work, and with no effort on the part of the operator except to place the stuff in the carrier and clamp it, then by pressing the foot on the treadle, the pieces are fed through the cutters and returned again finished on one end. The stuff can then be turned over and the opposite ends finished in the same way, thus completing the work on a number of pieces without removing them from the machine. By doing a quantity of stuff at one operation, the work is done faster and much better, as no fringe is left on the tenons, from the fact that the cutters pass through a solid mass of wood, the last piece being against a soft metal chip breaker, comes out clean and free from fringe.

This machine is simple, compact and durable, the frames being one solid casting without joints or bolts. The table can be adjusted with a screw for any length of tenon required, thus insuring accurate work.

They are made in three sizes to work stuff from 14 to 18 inches wide.

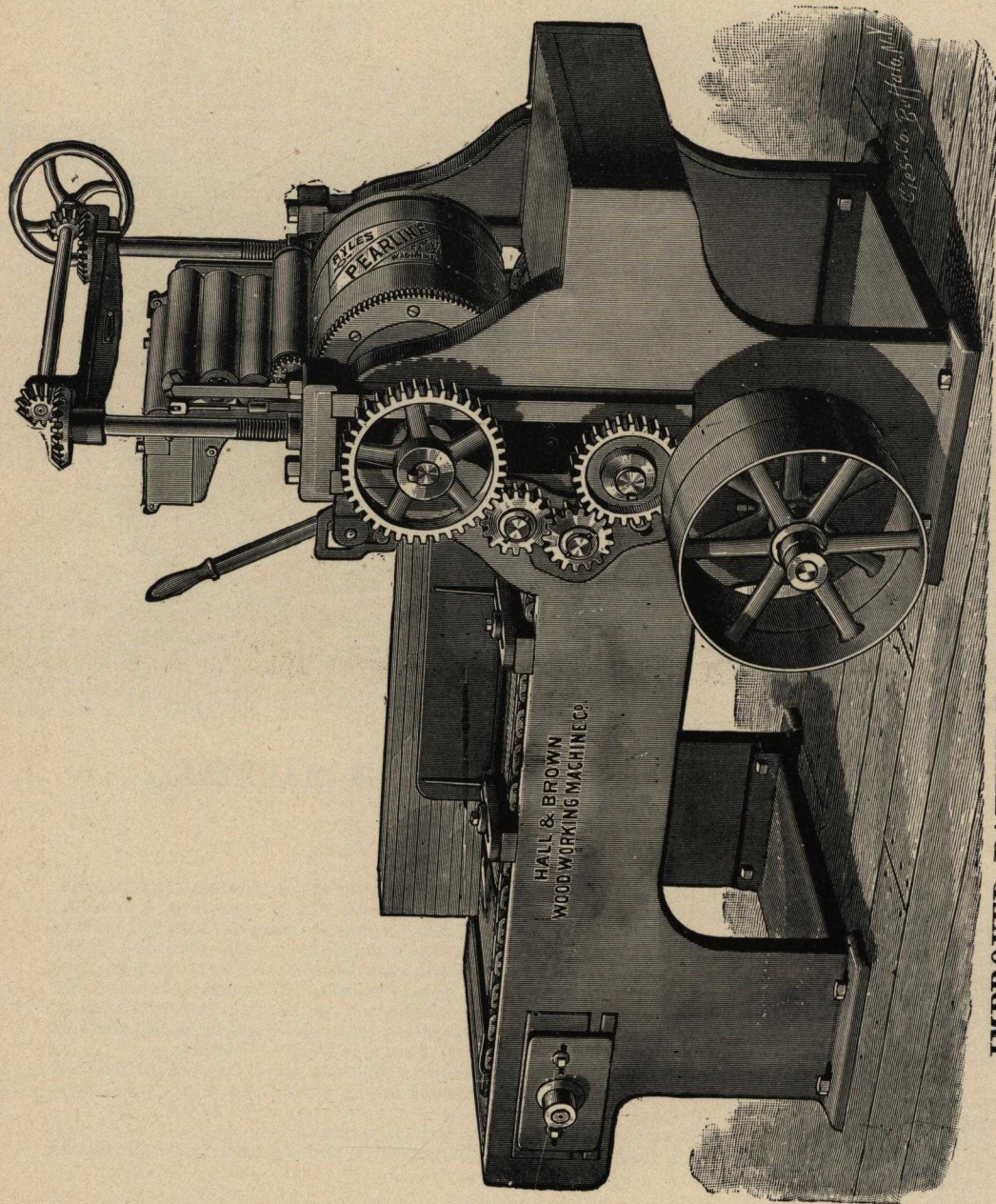
The pulleys on the counter-shaft are 12 inches in diameter and $7\frac{1}{2}$ inch face and should make 680 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belts, 7 inches wide, in length to suit from line shaft.

Two Cylinder Belts, in length to suit from counter-shaft.

One Feed Belt, 5 feet 7 inches long, $2\frac{1}{2}$ inches wide.



IMPROVED PATENT BOXBOARD PRINTING MACHINE.
Weight, 2800 lbs.

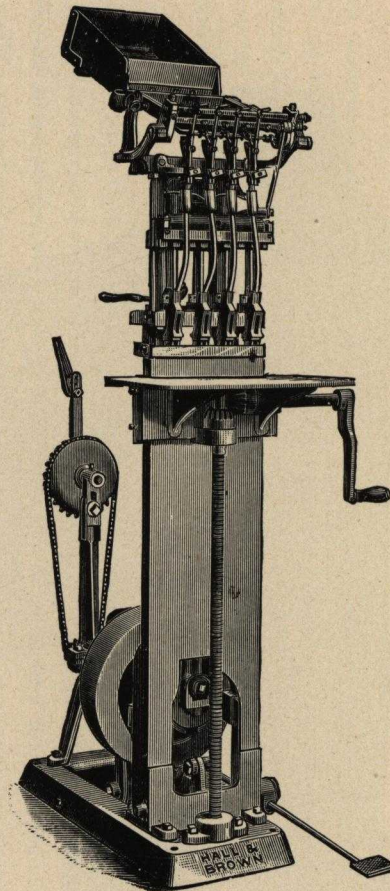
Improved Patent Box Board Printing Machine.

The above cut represents a machine for printing box sides and ends, instead of the old method of stencilling, doing the work much faster and better, sinking the letters below the surface, which prevents blurring by contact of the surfaces. It will print in a very rapid and clear manner all cards and trade marks, thereby making it of great importance to the merchant and manufacturer using large quantities of boxes for shipping, such as starch, saleratus, soap, oil, etc. The type or plate is cut in brass and secured to the shell of the upper cylinder in such a manner that it can be readily adjusted to print upon the board at the proper time. Ink is supplied to the rollers which are made of composition, by a reservoir, and evenly distributed over the type, the supply being under the control of the operator.

When not printing, the inking rollers can be instantly raised from the type by the action of a lever, and dropped down again when required printing the ordinary run of box stuff at the rate of about 2,500 impressions an hour. The boards or parts of boxes are piled upon the bed of the machine, as shown in the cut, the bottom piece of the pile being carried through by a continuous feed, receiving its impressions at the proper time add passing out at the end of the machine. It is simple and durable and can be operated by a person of ordinary intelligence. When the type or plate is fitted to the cylinder, which is done with counter-sunk screws, it should be marked to correspond with the number on the rim of the cylinder, and also with the number on the shell of the cylinder where the long lines are drawn. By doing this the plate can always be fastened on the shell at its proper number, and by slacking the four screws in the head or rim of the cylinder the shell with its type can be brought to its proper number or place by turning it in either direction. After this is done fasten the bolts and the type will strike the board in its proper place.

The Tight and Loose Pulleys are 16 inches in diameter, 4½ inches face and should make 250 revolutions per minute.

When Driving Belt is ordered it should be 4 inches wide, in length to suit from line shaft.



No. 1. NAILING MACHINE.

For want of space we illustrate but two Nailing Machines the No. 1 illustrated above, and the No. 4 illustrated and described on the two succeeding pages; we are, however, prepared to furnish intermediate sizes for different varieties of work.

Size of table No. 0 Machine, 7x10 inches.
Drop of table, 16 inches.
Automatic Feeder, 3 Tracks.
Diameter of Drive Pulley, 11 inches.
Face of Drive Pulley, 2 inches.
Revolutions per minute, 125.
Weight, 200 lbs.

Size of table No. 1 Machine, 18x10 inches.
Drop of Table, 14 inches.
Automatic Feeder, 4 Tracks.
Diameter of Drive Pulley, 14 inches.
Face of Drive Pulley, 3½ inches.
Revolutions per minute, 125.
Weight, 500 lbs.

Size of table No. 2 Machine, 18x10 inches.
Drop of Table, 24 inches.
Automatic Feeder, 5 Tracks.
Diameter of Drive Pulley, 12 inches.
Face of Drive Pulley, 4 inches.
Revolutions per minute, 325.
Weight, 750 lbs.

Size of table No. 3 Machine, 24x14 inches.
Drop of Table, 26½ inches.
Automatic Feeder, 6 Tracks.
Diameter of Drive Pulley, 16 inches.
Face of Drive Pulley, 4½ inches.
Revolutions per minute, 375.
Weight, 1200 lbs.

Wire or Edge Grip-cut Nails must be used with these feeders to give perfect satisfaction.

Box Nailing Machines.

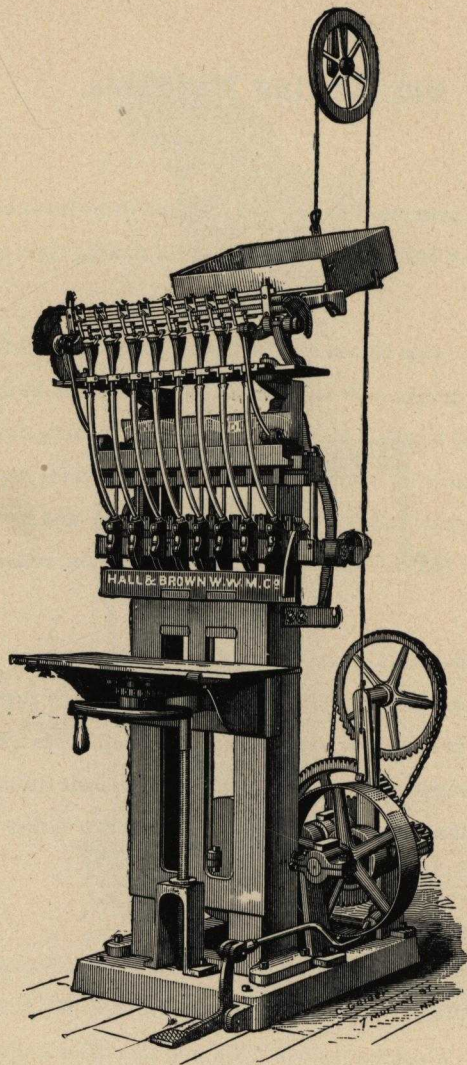
No. 0 Machine with Automatic Feeder, will feed and drive three nails up to $\frac{7}{8}$ inches long, any gauge or any thickness of stuff. Principally used for nailing cigar boxes.

No. 1 Nailing Machine with Automatic Feeder Attachment, will feed and drive four nails from $\frac{3}{4}$ to $1\frac{1}{4}$ inches long any gauge, will nail boxes from 2 inches to 14 inches deep, and from 2 inches to 14 inches wide, and length. Has lever attachment to move nail boxes and punches in and out to nail in any thickness of stuff. When required has independent, inclined table for nailing lining on tobacco boxes, caddies, etc. Can be removed and used for framing up and nailing bottoms on ordinary boxes. Has no automatic in-and-out attachment.

No. 2 Nailing Machine with Automatic Cut-off Feeder and automatic in-and-out attachments for nailing in different thickness of stuff at different revolutions, will feed and drive five nails from 1 inch to $1\frac{3}{4}$ inches, any gauge. Will nail boxes 2 inches to 16 inches wide, 2 inches to 16 inches deep, any length. Has in-and-out automatic attachment, will drive nails 4 inches from edge of stuff if necessary. This Machine will run either way and can be belted from above or below.

No. 3 Nailing Machine with Automatic Cut-off Feeder attached, has also in-and-out attachment for nailing in different thickness of stuff at different revolutions as is required when nailing on bottom of boxes which have thick ends and thin sides nailing automatically in the center of each. Will feed and drive six nails from $1\frac{1}{4}$ inches to $2\frac{3}{4}$ inches.

Will nail boxes from 3 inches to 24 inches wide, from 3 to 24 inches deep, any length. Is also to nail cleats on box ends, etc. When using machine for cleating, have nail boxes back so that the points of nails being driven will strike center of steel piece in clinching blocks; slacken screws on side of frame and push the plate back far enough to drive the row further from edge of stuff. Drive first row, then bring stuff out and move it sideways to nail second row. Keep foot on treadle, so second row will be driven without stopping the machine. Has in-and-out automatic attachment, will drive nails four inches from edge of stuff if necessary. This machine will run either way and can be belted from above or below.



No. 4. NAILING MACHINE.

The above cut represents our No. 4 Nailing Machine; want of space will not permit us to illustrate but two numbers our No. 1 and No. 4. No. 0 Machine is intended expressly for cigar boxes; No. 5 is intended as a framer or oil box nailer, and for cleating the ends. In view of the strong competition in the box business it is necessary for manufacturers to avail themselves of every improvement to lessen the cost of their product and save labor.

Size of table, No. 4 Machine, 30x14 inches.

Drop of table, 26½ inches.

Automatic Feeder, 8 Tracks.

Diameter of Drive Pulley, 16 inches.

Face of Drive Pulley, 4½ inches.

Revolutions per minute, 375.

Weight, 1400 lbs.

Size of table, No. 5 Machine, 24x14 inches.

Drop of table, 26½ inches.

Feeder, 6 Tracks.

Diameter of Drive Pulley, 16 inches.

Face of Drive Pulley, 4½ inches.

Revolutions per minute, 375.

Weight, 1150 lbs.

Wire or Edge Grip-cut Nails must be used with these feeders to give perfect satisfaction.

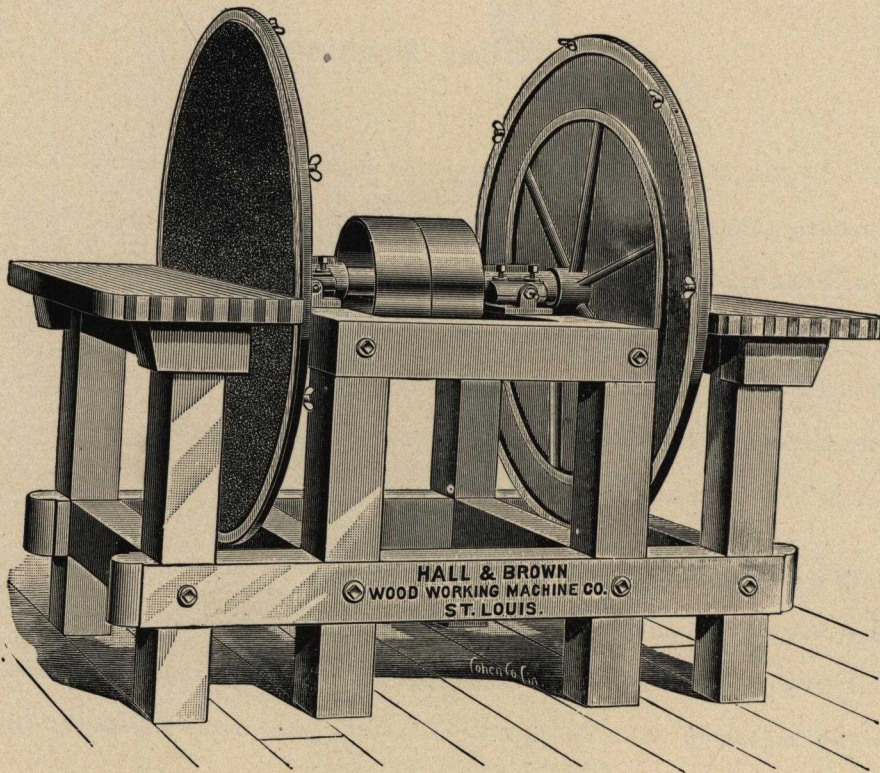
Box Nailing Machines.

No. 4 Nailing Machine with Automatic Cut-off Feeder Attachment, has also in and out attachment for nailing in thick and thin stuff at different revolutions as required. When using Machine for cleating have nail boxes back so as the points of nails being driven will strike the center of steel piece in cleating block. Slacken the screws on outside of frame and push the plate back far enough to drive the row furthest from end of stuff. Drive the first row, then bring the stuff out and move it sideways to nail the second row. Keep foot on treadle so second row will be driven without stopping Machine.

When nailing on bottom of boxes which have thick ends and thin sides nailing in the center of each automatically. This Machine is used for nailing cleats on box ends, etc. Will feed and drive 8 nails from $1\frac{1}{4}$ inches to $2\frac{3}{4}$ inches, any gauge. Will nail boxes 3 inches to 30 inches deep, any length. Will drive nails four inches from edge of stuff if necessary. Has in-and-out Automatic Attachment.

No. 5 Framing or Oiling Box Nailer is used on boxes where the ends and sides are the same thickness and for framing up boxes, also to do cleating. Has no in-and-out Automatic Attachment, can be set to nail in any thickness up to $1\frac{1}{2}$ inches.

Has plain feeder attachment which will feed only one certain number of nails at each revolution. When using Machine for cleating have nail boxes so that the points of nails being driven will strike center of steel piece in clinching block. Slacken the screws on side of frame and push the plate back far enough to drive the row furthest from edge of stuff. Drive first row, then bring stuff out and move it sidewise to nail second row. Keep foot on treadle, so second row will be driven without stopping Machine. Has in-and-out automatic attachment will drive nails four inches from edge of stuff if necessary. This Machine will run either way and can be belted from above or below.

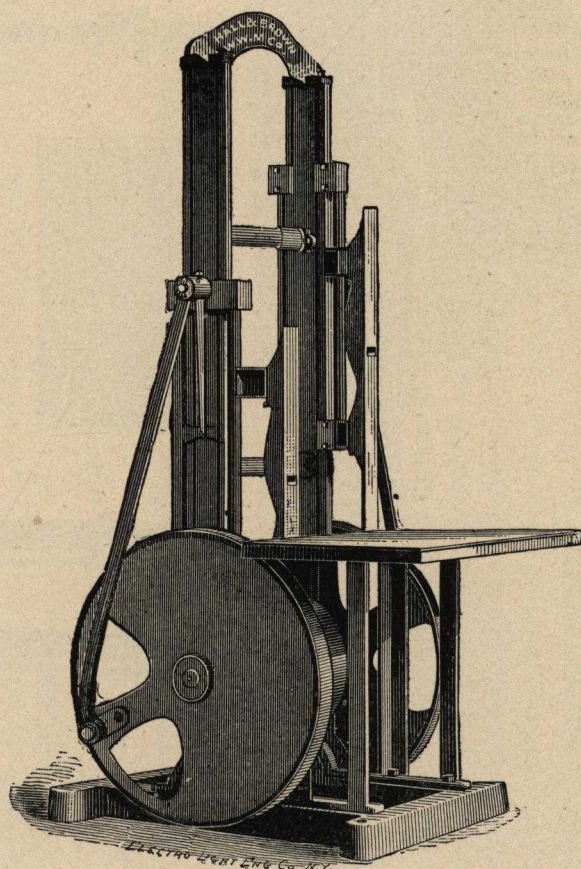


SAND PAPERING MACHINE.

Weight, 800 lbs.

The above cut represents our Sand-Papering Machine for Sand Papering Boxes, Shooks, etc. The frame is made of well seasoned lumber and put together with mortise and tenon, and securely bolted together with joint bolts. The shaft is large size and of the best steel and runs in long boxes babbitted with the best genuine metal. The Machine as illustrated has 48 inch disc wheels, but it can be furnished with any size wheels, ordered. The discs or wheels are made of wood securely bolted to an iron flange secured to the shaft; on the back of the wooden disc is secured a wrought iron ring with a corresponding ring on the outside of the face of the wheel which secures the sand paper to the disc wheels. The face of the disc wheels are first covered with Brussels carpet, then several thicknesses of paper can be applied and securely held in place with the wrought iron ring or hoop. When one thickness of paper is worn out, this can be torn off and a fresh piece is exposed ready for use; when it is required to remove the paper it can be done in a few moments by removing the outside ring. The wheels can be covered with a hood and attached to an exhaust fan to remove all dust, if desired. A rest can be attached to the frame on each side in front of the discs if desired, this rest is not shown in the cut, as many prefer a portable table or bench for the purpose. Two boys can be employed on large boxes and four on small boxes at the same time without interfering with each other, if desired.

The Tight and Loose Pulleys are 12 inches in diameter and $6\frac{1}{2}$ inch face, and with a 48-inch disc should make 300 revolutions per minute, with a 36-inch disc, 350 revolutions per minute.

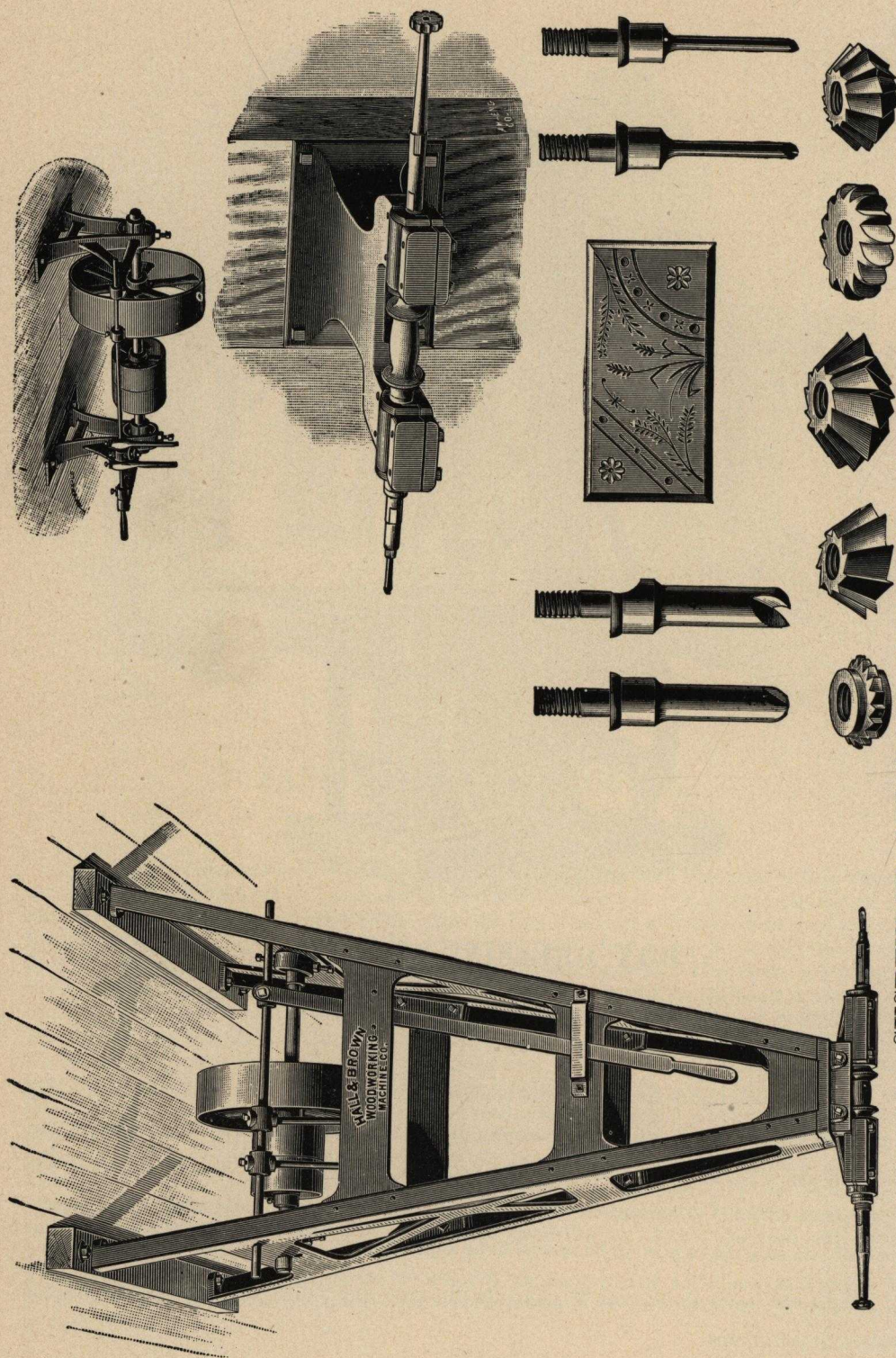


BOX DRESSING MACHINE.

Weight, 900 lbs.

The above cut represents our balance box dressing Machine expressly designed for dressing off the ends of boxes after being nailed and supplies a long felt want for a Machine to do this work properly. The Machine is built strong and substantial in all its parts to withstand the severe thrust which it is subject to. The wheel and pitman are well balanced, consequently runs still and does not require to be braced to be kept in position while in use.

Tight and Loose Pulleys are 16 inches in diameter and 3 inch face and should make 125 revolutions per minute.



SUSPENDED AND POST CARVING MACHINES.

Weight of Suspended Carver, 350 lbs.

Weight of Post Carver, 200 lbs.

Suspended and Post Carving Machines.

These Machines are designed for ornamenting or carving different classes of work, and greatly reducing the cost of doing it by hand, and it will be found to exceed the expectations of the operator for the purpose.

The Machine will be appreciated especially by manufacturers of Furniture, Organs, Brackets and various other classes of ornamental work, and at the same time reducing the cost of same.

The Suspended Carver Frame is intended to be securely bolted to the ceiling above, the counter-shaft and belt shifter being attached to same.

The Post Carver can be attached to any convenient post.

The counter-shaft for the last mentioned Machine being separate, and can be placed in any position desired.

Both Machines are built with double end spindle, which will be found very convenient, thereby enabling the operator to use rosette or drill bits upon one end, and diamond, round or oval cutters on the opposite end, and thereby save time required in shifting cutters.

The spindle and pulley are made of one solid piece of superior steel.

The pulley is provided with wide flanges or lips, which are fitted carefully to fill between the boxes.

Each of the boxes are 7 inches in length, the box and cap being planed together, the cap having a projection which fits perfectly in a corresponding recess planed in the box, thus insuring perfect solidity, and are lined with a heavy lining of the best genuine babbit metal.

We furnish with each machine nine bits or cutters which are in general use on standard work.

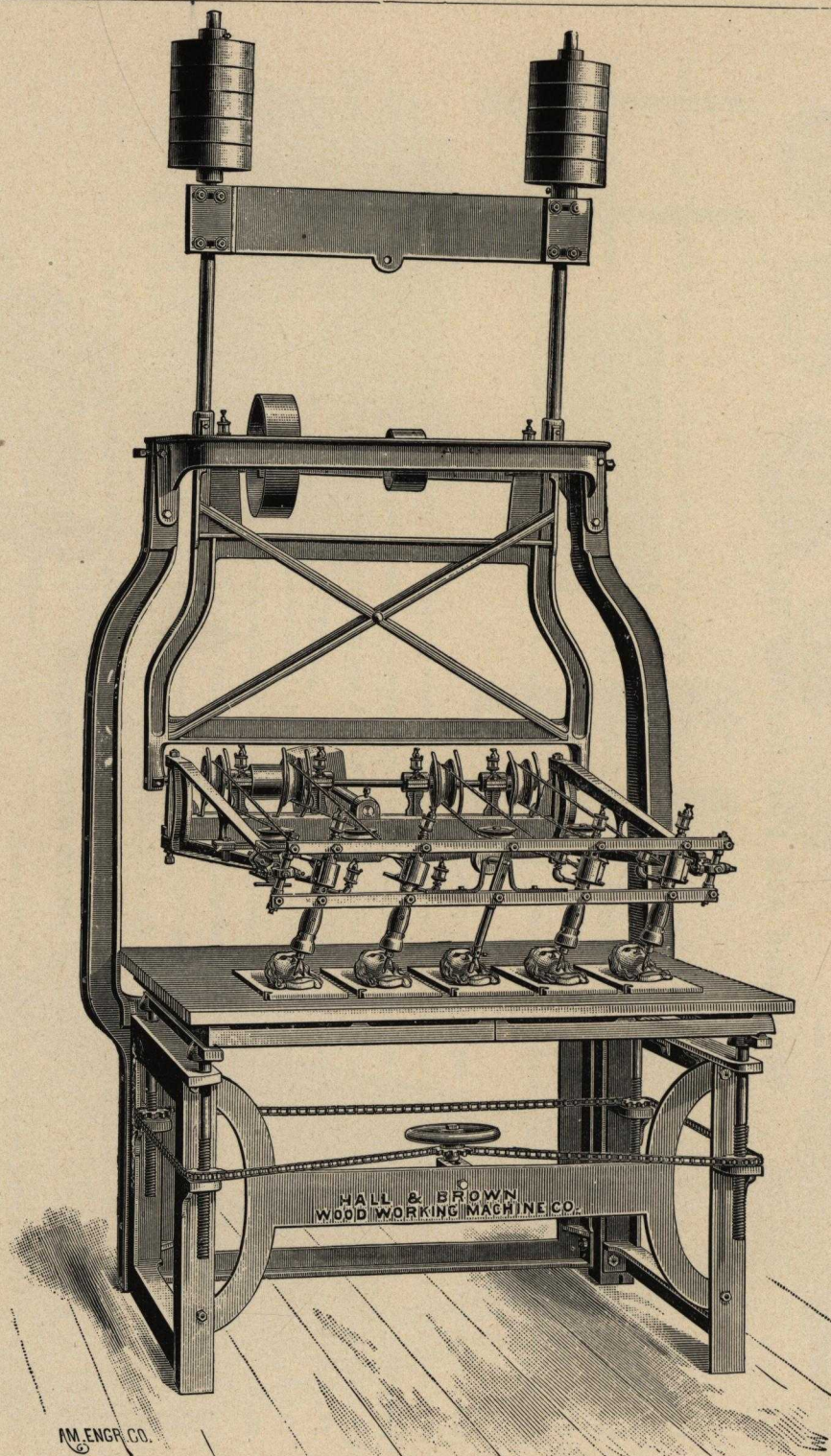
Special bits or cutters will be furnished promptly for any design required.

The Tight and Loose Pulleys are 6 inches in diameter and $3\frac{1}{4}$ inch face and should make 1000 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, 3 inches wide, in length to suit from line shaft.

One Spindle Belt, 10 feet 6 inches long, 2 inches wide.

**ROHLMAN CARVING MACHINE.**

Weight, 3250 lbs.

Rohlman Carving Machine.

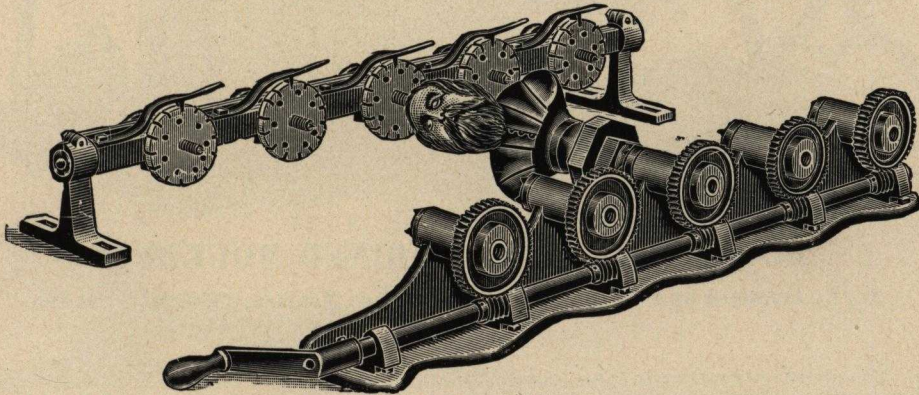
The machine here illustrated represents our new improved Carving Machine; it is built from new designs, and embraces many important improvements; it is very strong and substantial, yet not cumbersome in working, but is easily handled, and for convenience of adjustment is unsurpassed, and will supply a longfelt want, not only in Furniture Factories, but for Car, Organ and Piano Factories, and other wood-working establishments where wood carving is done. The machine will carve four duplicate pieces, any length, at one operation, if not over $7\frac{1}{2}$ inches wide; or it will make two duplicate pieces any length if not over 15 inches wide; and if wider is desired it will carve one piece any length and in width from 15 to 30 inches. The Bitts can be handled conveniently and in any direction within an angle of 30 degrees; the top, or table can be raised or lowered to make thick or thin work, and remain the proper height for the operator; the table also rests upon sliding ways so that it can be adjusted for the convenience of the operator on different varieties of work.

The machine will carve most any kind of ornamental work without any extra attachments upon the table, as the cutters are so arranged that they can be carried in any direction and will cut under at an angle of about 30 degrees, which is more than is required for ordinary work, but in case full size heads, or similar work is desired we furnish with each and every machine a reversible top or attachment (see cut No 1) for this purpose. We can also furnish



Cut No. 1.

if desired an extra attachment consisting of Centers with graduated index (see cut No. 2) so



Cut No. 2.

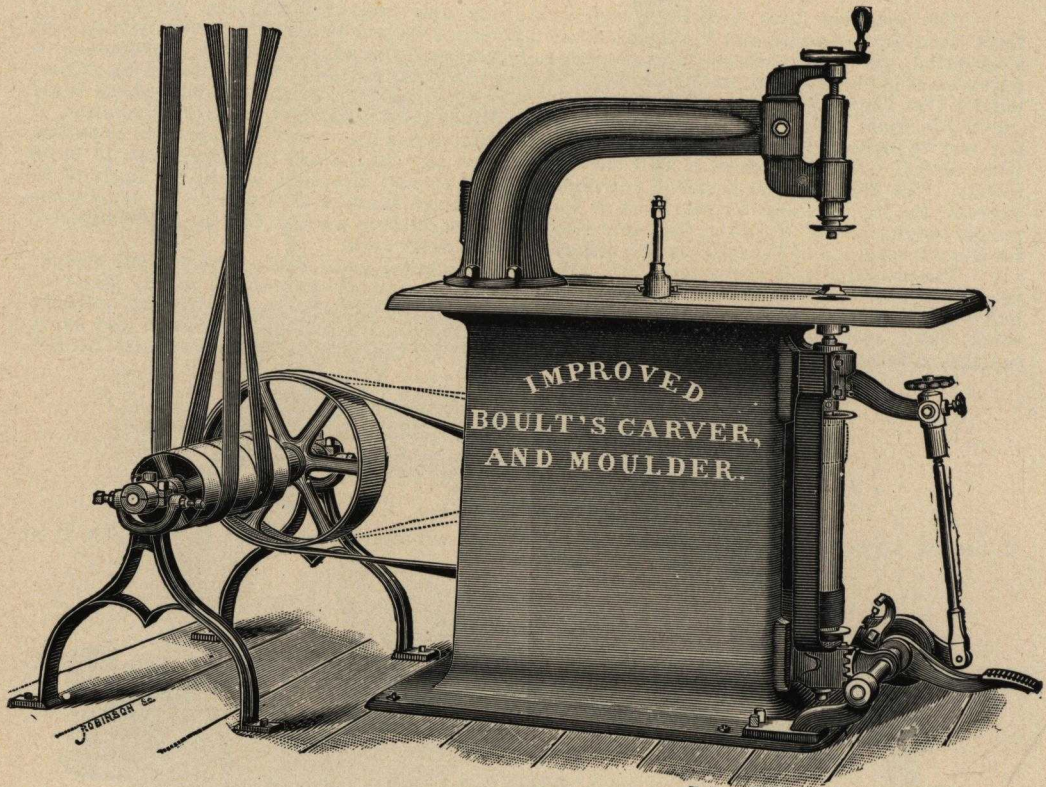
that four duplicate articles, such as legs, posts, statues, etc., can be carved on one, two or four sides, or all around. There is a great variety of work that can be finished on the machine such as heads with hair, and many other articles which do not require an absolutely smooth surface; smooth work or flat surfaces would require to be sand-papered. In case the inside of a square



Specimens of Carving.

is desired to be worked, of course the corners will be left round, the same size as the bit, and if wanted sharp must be finished by hand, but the outside corners of the square can be finished perfectly square and sharp, or round if desired; work similar to raised panels, can be accomplished on the machine with suitable bits and will leave the O. G. edge perfectly smooth.

The Tight, or Driving Pulley on the machine is 8 inches in diameter and 3 inch face, and should make 1200 revolutions per minute.



BOULT'S PATENT COMBINED MOULDER.

No. 2, Arranged as a Shaper, Edge and Surface Moulder, Weight, 1100 lbs.

The above cut represents the celebrated Boulton's Combined Moulder which in many respects is the simplest and most useful Machine produced for the various classes of work for which it was intended.

Paneling and Grooving are quickly and perfectly formed and moulded to any design upon the surface of wood, for which a pattern or form may be provided, for ornamenting cars, fences, furniture, organs, buildings, carriages, coffins, newel posts, and pew ends; also for cutting plain grooves, dados, etc., mortising and cutting dove-tail dados for joining work together, and for all work necessary to be done on the surface of lumber, in regular or irregular lines. The operator, having at all times full control, is able to do all he wishes in a quick and perfect manner.

By making all ornaments in the solid wood, many glue joints are saved, also a large percentage of time and material, at the same time giving a better job. Thirty-three per cent. less lumber is required to effect the same appearance than by the old method of planting on, also six operations; viz, re-sawing, preparing the material, marking out, jig-sawing, moulding, and planting on; either process requiring more time than it takes to make a better job by using the facilities afforded by Boulton's Machine. Every one is aware that work done in solid wood cannot come to pieces by hard usage or exposure to damp and heat.

The Tight and Loose Pulleys are 7 inches in diameter and $3\frac{1}{2}$ inch face and should make 765 revolutions per minute.

BELTS WHEN ORDERED.

Belts, $3\frac{1}{2}$ inches wide, in length to suit from line shaft and counter.

**ATTACHMENTS FOR BOULT'S COMBINED MOULDER
ILLUSTRATED ON OPPOSITE PAGE.**

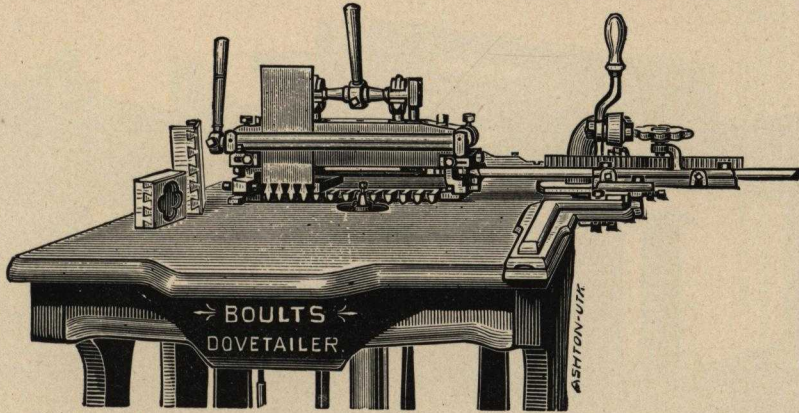


Fig. 1. DOVETAIL ATTACHMENT.

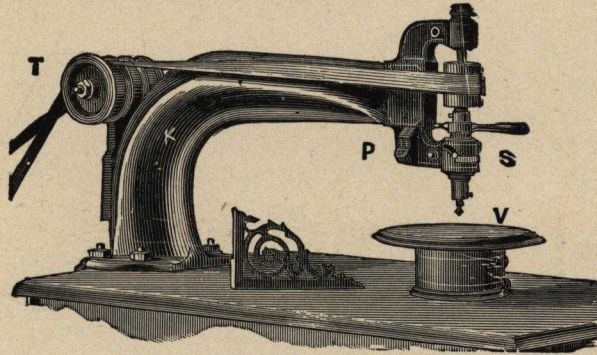


Fig. 2. SCROLL ATTACHMENT.

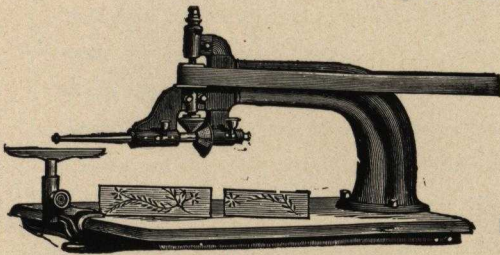


Fig. 3.

VENEERING AND LINING ATTACHMENT.

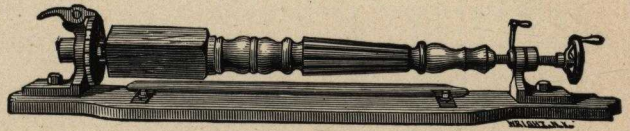


Fig. 4.

FLUTING ATTACHMENT.

Fig. 1. Represents the Dovetail Attachment as applied to the Table top.

We can furnish this attachment to dovetail 13 inches or 18 inches wide. Weight for 13 inches wide 200 lbs., 18 inches wide 225 lbs., 3 Dovetail bits will be furnished with either size.

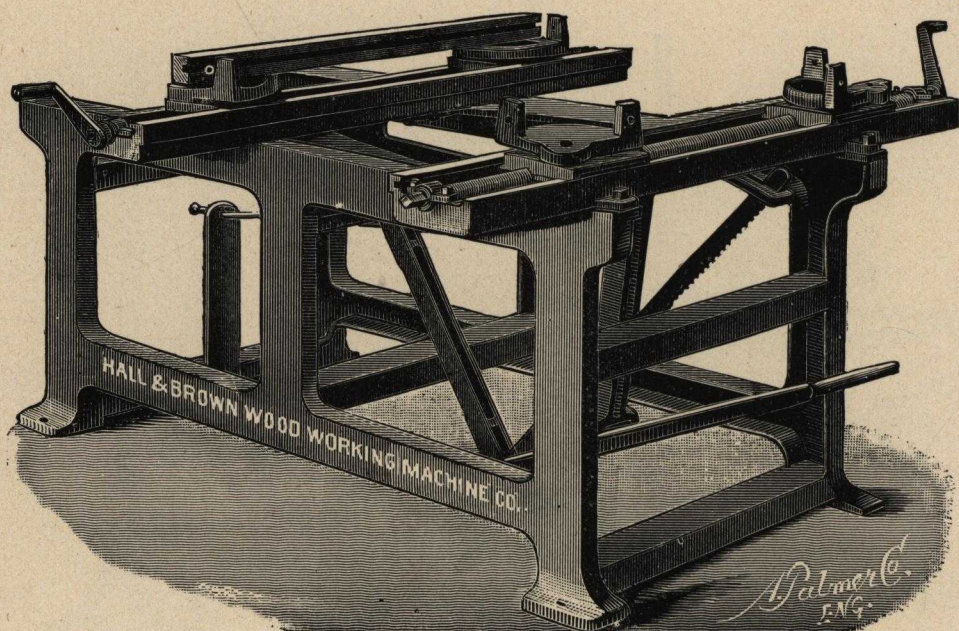
Fig. 2. Scroll Moulding Attachment consists of head P. S. Pulley T. and small table V and is furnished with cutters 100, 101, 102 and 103.

When combined with the No. 2 Moulder forms No. 3 Moulder, weight 1200 lbs.

Fig. 3. Attachment for carving veneering and lining, has paper and iron friction wheels and runs smooth and noiseless.

Fig. 4. Fluting attachment for holding table legs, balusters, etc., for straight fluting on any Single or Double Spindle Shaper.

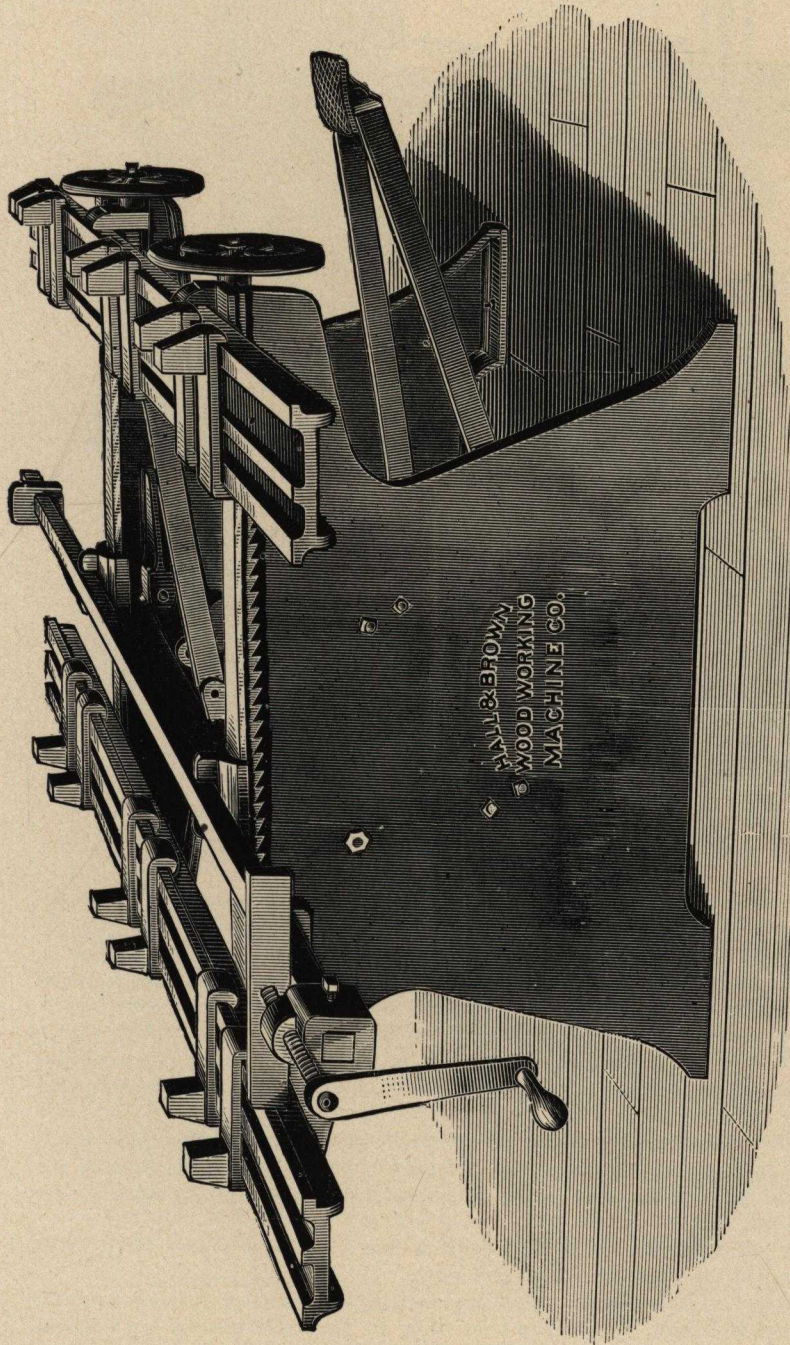
Full instructions will be furnished with each Machine how to apply the different attachments and prepare the material.



SASH CLAMP.

Weight, 950 lbs.

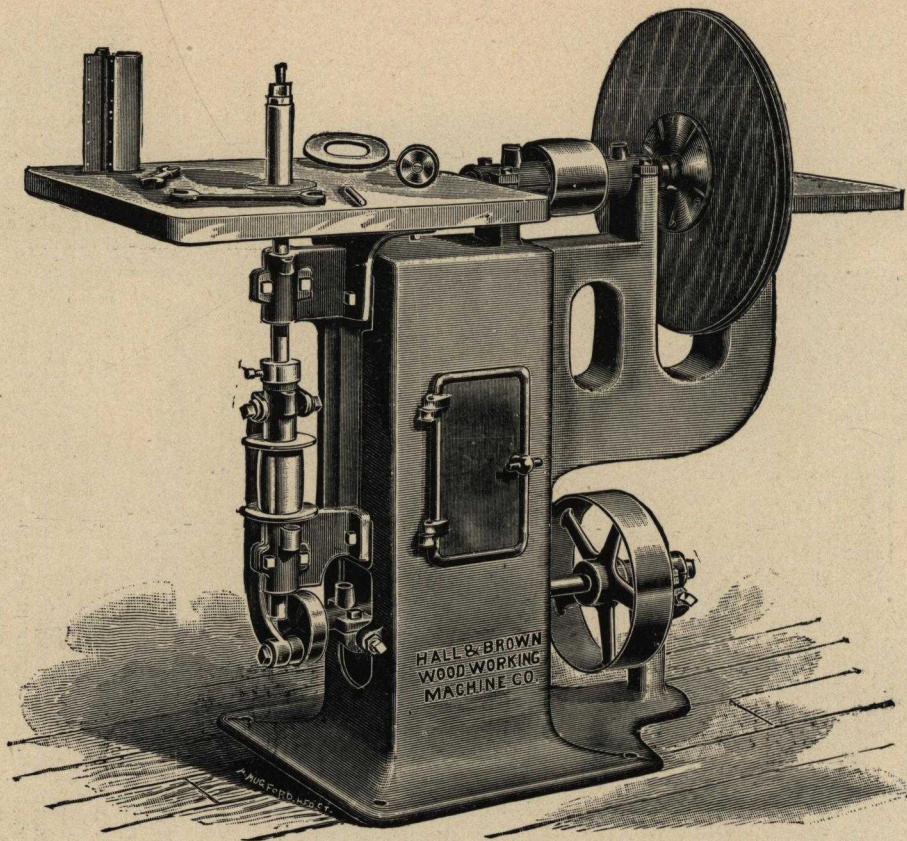
Sash manufacturers have long felt a want for a good clamping machine for sash that could be found always reliable in clamping sash square. For a perfect machine we have constructed it entirely of iron and steel, as this class of machines has heretofore been made with wood frames, which would soon rack and would not clamp sash square. The main frame of this machine is cast in one piece, making it perfectly rigid. The heavy top rails are planed and have long slabs or bearings on the main frames. The corner blocks for holding the sash are pivoted to the traveling blocks, which work on the top of the heavy rails and are operated in and out by a right and left hand screw, whereby each corner can be moved an exact distance from the centre, and remain in a rigid, fixed position. When once adjusted for one size, and set square, it always remains perfectly square. Odd sizes of sash can be clamped almost as quickly as regular sizes. This clamp is very heavy and strong in every respect. We think we are safe in saying it has no equal on the market, and, by its use, from fifty to seventy-five per cent. of labor is saved over other methods of clamping sash. It not only brings every joint up to its place, but makes the sash perfectly square, clamping the four sides at one operation by simply pressing the lever down with the foot. Either pins or wedges can be used. Capacity is to work sash up to three feet ten inches by five feet, and down to twelve inches square.



SINGLE MOTION DOOR AND BLIND CLAMP.

Weight 1735 lbs.

This Machine is made solid and substantial, for in clamping doors, considerable strain is used. The levers are arranged to get the greatest leverage when the door is nearly clamped, or when the greatest pressure is required. It is operated by simply pressing down one lever with the foot, and turning the end screw by hand. The changing to different sizes to be clamped is accomplished by raising one side of the sliding slab, which will disengage the two pawls from the rack shown on side of clamp, allowing the slab to be placed in any position, when by allowing the slab to return to its proper place the pawls readily engage in the rack, and it is then ready for clamping. The front slab has an independent adjustment for regulating the pressure, or giving greater pressure on one end than the other, when so desired. It will clamp any size up to four feet four inches wide by eight feet two inches long. With each Clamp we furnish twelve long dogs for Doors, and sixteen short ones for Blinds. When so ordered we can furnish Sash Clamping Attachment for this machine, which is easily put on or taken off in a few minutes, and when on will clamp sash on four sides perfectly square in one motion.



NEW UNIVERSAL SAND-PAPERING MACHINE.

Weight with Wood Top, 750 Lbs.

Weight with Iron Top, 900 Lbs.

These are indispensable tools for cabinet, chair, bracket, organ, carpenter and job shops, for smoothing the edges of scrolls, brackets, and irregular pieces of all kinds, whether wholly curved or partially straight. A perfectly smooth surface is produced, ready for filler or varnish directly from the saw, and the Machine will easily do the work of four or five men and save 75 per cent of the sand paper over hand work, besides leaving a better and truer surface.

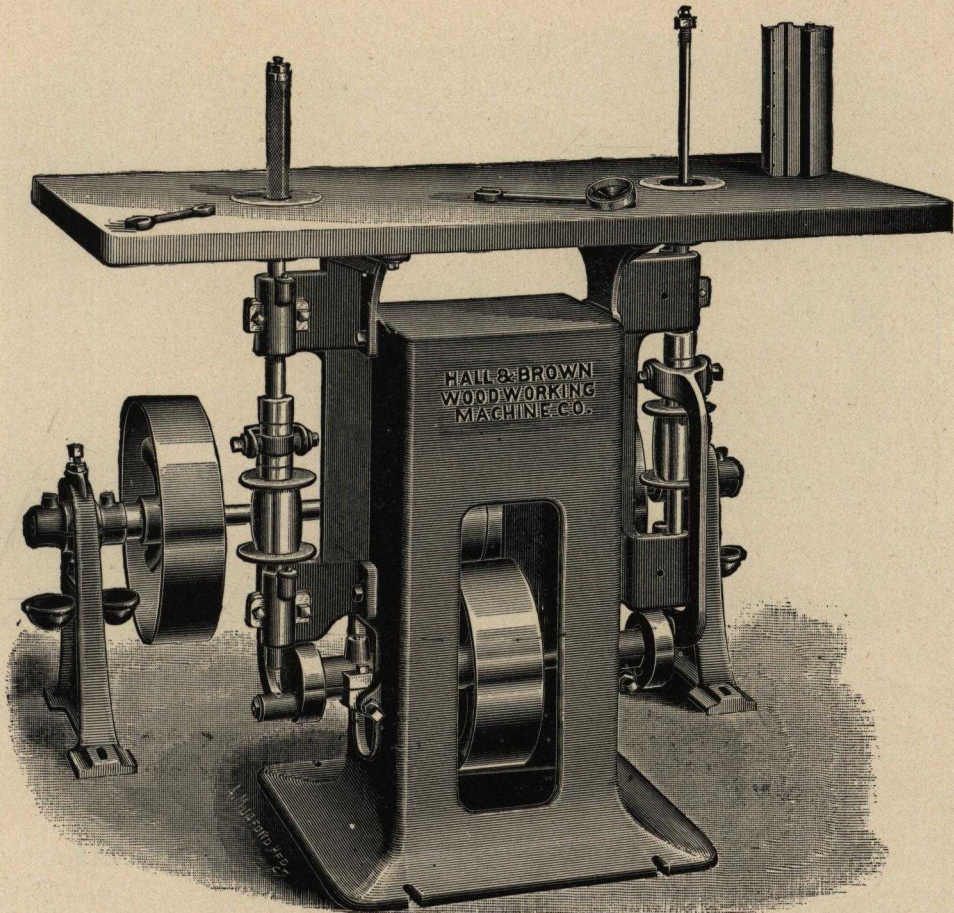
The frame is cast in one piece, and the Machine is all Iron and steel except tables, which may be of iron when ordered. The vertical spindle has reciprocating motion (to wear the paper evenly), and is provided with a special roll, on which sand paper is held by screwing down the nut at the top of the spindle.

The disc is provided with a ring for clamping the sand paper over the outer edge, and is usually made 21 inches in diameter. The disc and roll spindle being on opposite sides of the Machine, two persons can work at the same time. The disc table can be tilted to an angle for beveled work.

The bearings are all extra long and lined with a fine quality of metal, with extra arrangements for oiling, and the workmanship is first class.

Rolls may be used up to 4 inches in diameter, two inches being the size usually sent, and they are usually $7\frac{1}{2}$ inches in length. There are iron rings in the table around the vertical spindle which may be changed for different sizes of rolls.

The Counter Shaft has tight and loose Pulleys 8 inch in diameter $4\frac{1}{2}$ inch face and should make 650 revolutions per minute.



DOUBLE SPINDLE SAND-PAPERING MACHINE.

Weight, 900 lbs.

This is an extremely useful and labor saving machine, and no wood shop can afford to be without one, particularly on such work as brackets, furniture, chairs, organs and pianos, cars, etc., etc. On work directly from the saw, a perfectly smooth surface is produced on a great variety of shapes which have heretofore been done by hand, and the machine will easily do the work of several men and save three-quarters of the sand-paper, besides doing better work.

The frame is cast in one piece, is heavy and rigid, and has a broad base for resisting the vibrations of the cranks. The spindles have a reciprocating motion besides revolving at a high speed. The sand-paper is thus worn evenly and scratches are avoided.

The rolls are the most satisfactory for the purpose now in use, having an elastic surface and provision for straining the paper very tight, and they are held to the spindles by a cupped washer and nut. The body is kiln-dried hard wood, and they cannot get out of center or out of truth by any fair usage.

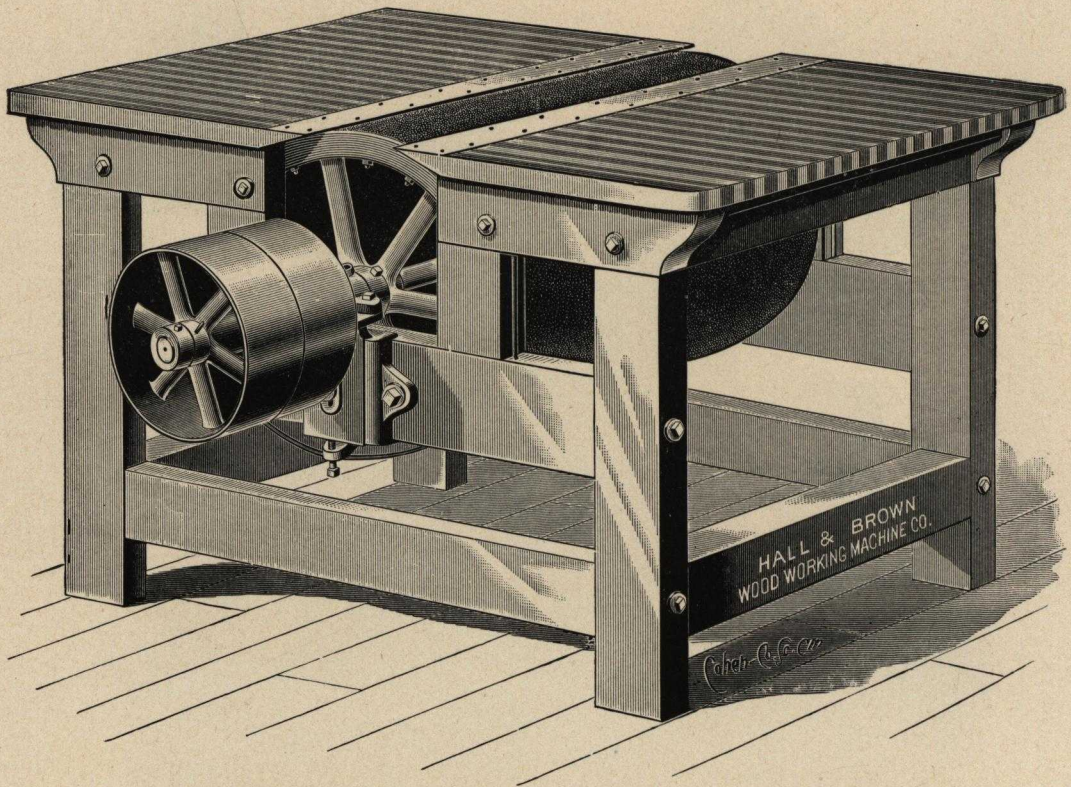
The bearings are extra long and lined with fine babbitt metal, with ample oiling arrangements. The oil cups have covers to prevent access of dust and sand.

The spindles are of steel with brass friction collars on the pitman sleeve, and the top sections are made detachable from the body, so that when necessary, very small sections may be used.

Iron center plates made detachable from the table, surround the spindles and they are bored to match the rolls. The table is usually of kiln-dried cherry, glued up in strips, but will be made of iron on order.

Rolls up to 4 inches diameter may be used and two are furnished with each machine, usually $1\frac{1}{2}$ and 3 inches diameter, and $7\frac{1}{2}$ inches long taking ordinary sheet sand paper. Other sizes are furnished to order.

Counter shaft has Tight and Loose pulleys 8 inches diameter and $4\frac{1}{2}$ inches face, and should make 650 revolutions per minute.



No. 1. HAND-FEED SAND-PAPERING MACHINE.

Weight, 500 lbs.

We present cut of our Hand-Feed Sand-Papering Machine. This is an old stand-by of every shop, and can be used for all classes of wood, and can be made to give a good finish.

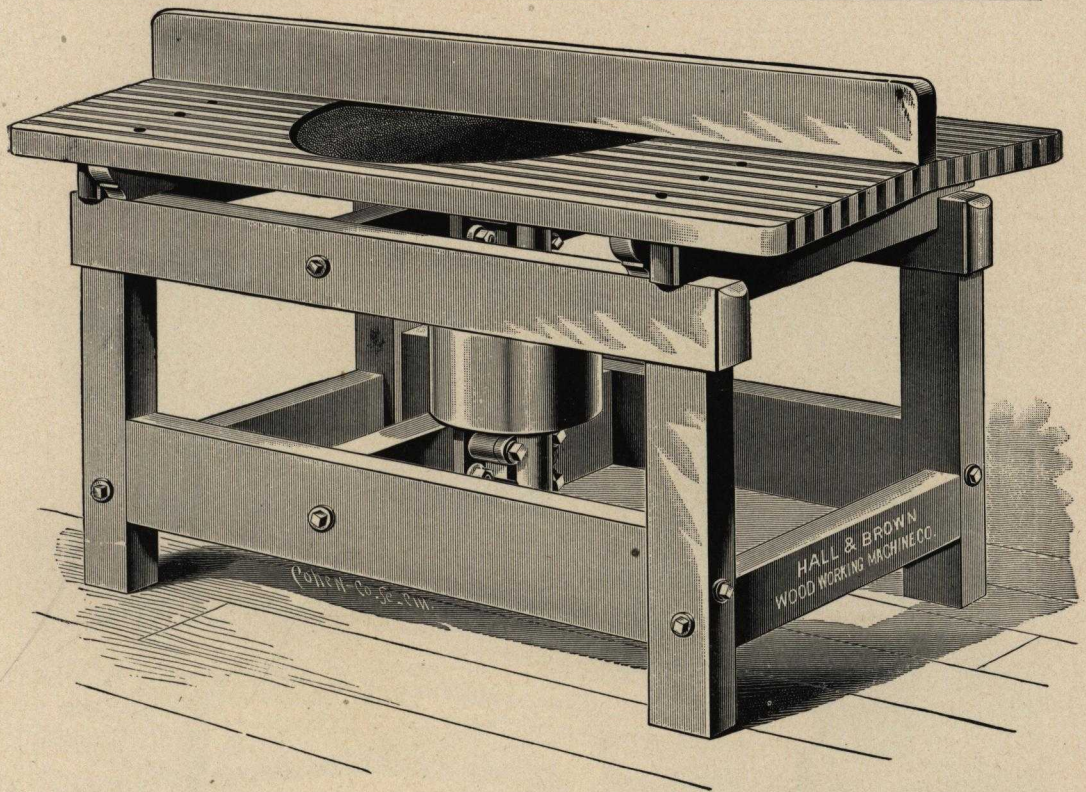
The frame is of hard wood and well made, and stands solidly on any floor, everything being in perfect balance. The drum is adjustable, up and down at the will of the operator, which will be found a great convenience. The adjusting screws are on the outside, and raise and lower the drum in planed iron slides.

The sand-paper is very quickly put on.

The tables are glued-up strips, and at the mouth are tipped with steel, and come to a very acute angle. Both tables being adjustable are brought very close together, and just allow the drum to be raised enough to come slightly above the surface of tables, thus insuring a good polish.

We can furnish the drum, etc., without the tables, for furniture men; or can supply the shaft, pulleys and flanges, so that the user himself can cover them with wood, carpet and rubber.

Tight and Loose Pulleys are 12 inches in diameter and $5\frac{1}{2}$ inch face and should make 450 revolutions per minute.



No. 2. VERTICAL CARRIAGE SAND-PAPERING MACHINE.

Weight, 550 lbs.

The above cut represents our new Hand-Feed Sander for straight or bent work, and especially for all carriage, wagon and buggy factories, for truing-up and polishing any kind of wood in the form of bodies, panels and seats, and any work of that class.

The frame is made of hard wood, and is bolted throughout in a very superior manner by bolts running clear through. It is very strong and stiff and gives the machine a good base to rest on.

The disk is about three feet in diameter, and runs on a vertical spindle, which is adjustable vertically, so that it can be rigged instantly for any cut desired. The disk is covered with the very best Brussels carpet, and the paper is fastened on in a very ingenious and improved manner.

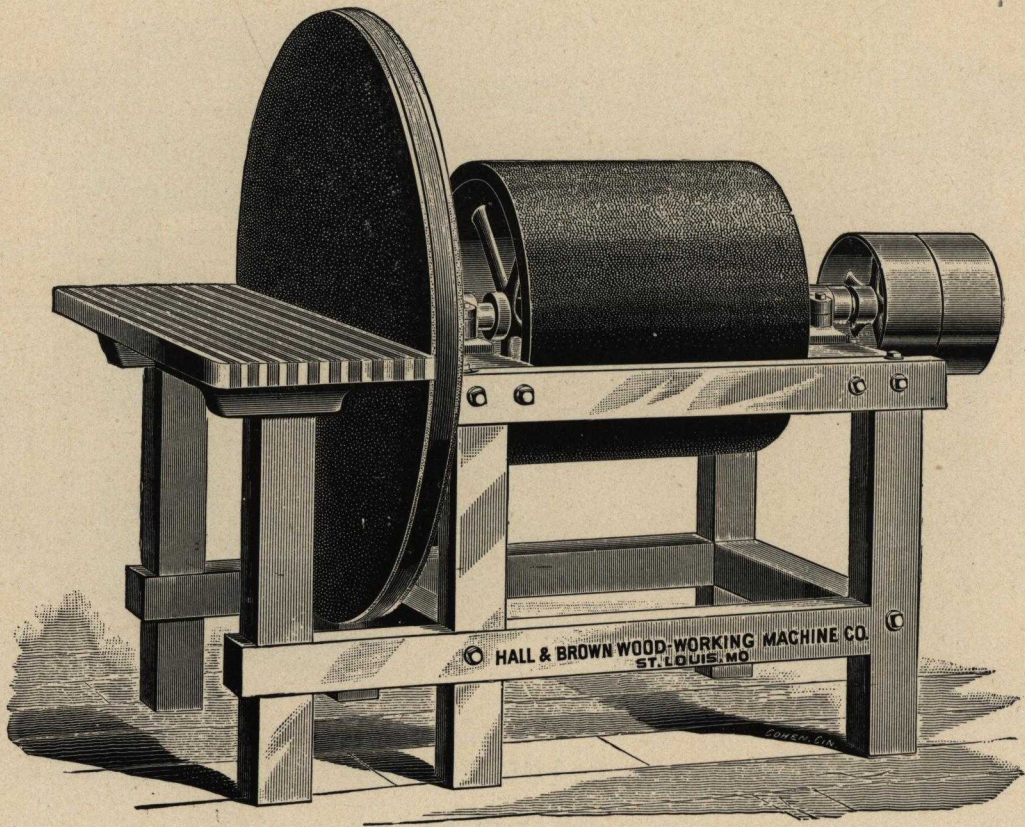
The table (which is of glued-up hard wood) is made in two halves and either side can be lifted off, giving free access to the disk.

The guide is arranged in the center of the table; two men can operate on this machine, one on each side of the guide.

We commend this machine specially to carriage and wagon makers, also manufacturers of bodies and gearing, and to all parties having wood work of almost any shape or size to polish, which can not be handled in the self-feed machine.

A counter-shaft is placed on the floor to operate this machine.

The Tight and Loose Pulleys are 12 inches diameter and $6\frac{1}{2}$ inch face and should make 600 revolutions per minute.



No. 3. COMBINED DISK AND DRUM SANDER.

Weight, 700 lbs.

The above cut represents our Combined Disk and Drum Sander, and will be found suitable for a large variety of work. Most useful and durable machine for the polishing of long or short stuff, straight or cross-grained stock of soft or hard wood.

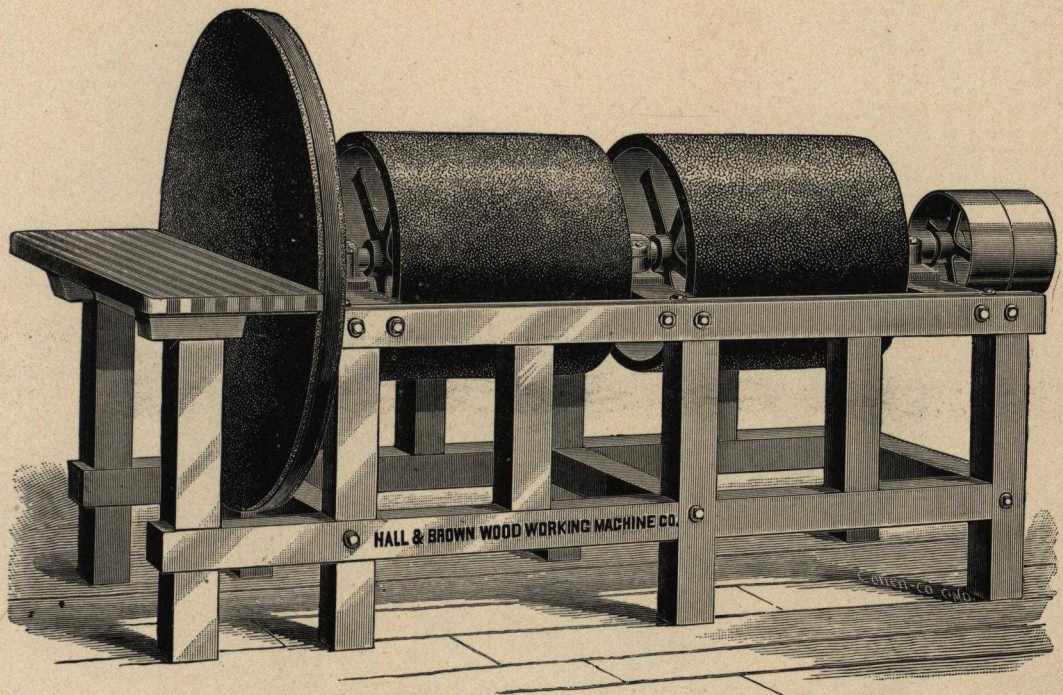
The frame is made of hard wood; mortised and tenoned, being bolted throughout in a very superior manner, making a very substantial frame. The journal boxes are extra length and large diameter, and are lined with genuine babbitt metal.

The sand drum is of large diameter and 24 inches long, and is covered with the very best material to insure a fine finish on the work—the sand-paper being attached to the drum in a very simple manner, allowing the whole surface of the paper to be used.

The disk is 42 inches in diameter, or 48 inches if desired, and is made perfectly true on its face, being covered with the best packing. An arrangement is provided for fastening the paper on the disk to make a perfectly true and even surface. The disk is built up and made on an improved principle, so there is no possibility of its warping or getting out of true.

An adjustable table is attached to the frame, being placed at right angle to the disk, allowing the shortest kind of stock to be squared up, and giving a better finish than can be done any other way.

Tight and Loose Pulleys are 12 inches in diameter, 6½ inch face, and should make 350 revolutions per minute.



No. 4. COMBINED DISC AND DOUBLE DRUM SANDER.

Weight, 800 lbs.

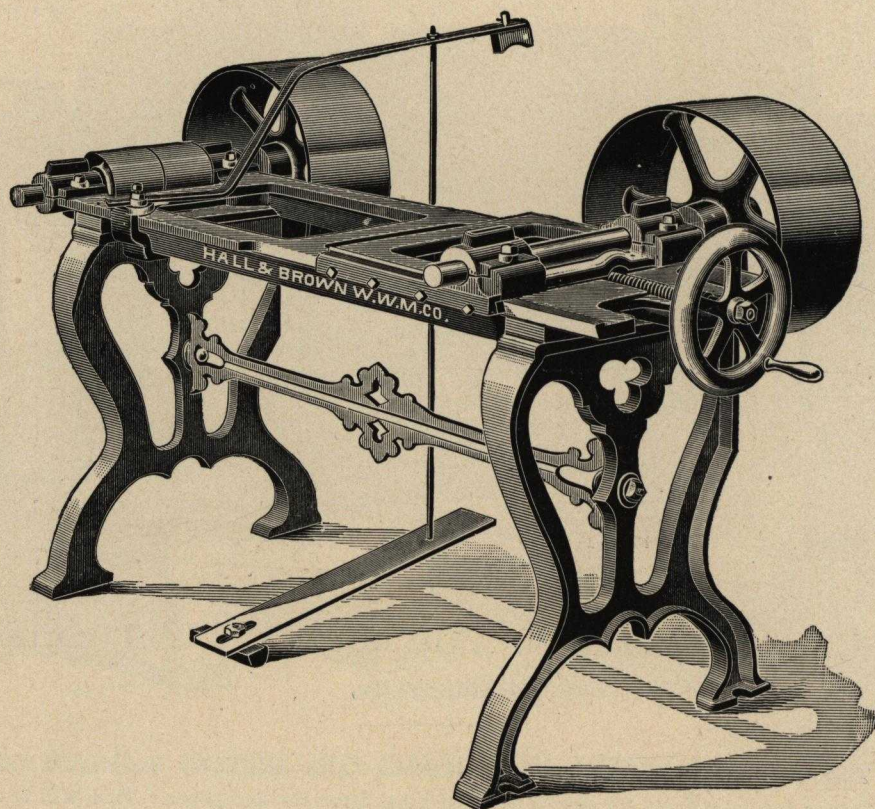
This machine is similar to our No. 3 Combined Disc and Drum Sander, but with the advantage of having a drum for coarse paper and one drum for fine paper. This will be found a great advantage for general work, as the stock can be passed from one drum to the other. This saves time in handling, therefore money in production. The frame is made of hard wood mortised and tenoned, being bolted throughout in a very superior manner, making a very substantial frame. The journal boxes are of extra length and large diameter, and lined with genuine babbitt metal. A journal box is placed between the drums on this machine, making three heavy bearings supporting the drums and making them reliable in operation.

The sand drum is of large diameter and 24 inches long, and is covered with the very best material to insure a fine finish on the work—the sand paper being attached to the drum in a very simple manner, allowing the whole surface of the paper to be used.

The disc is 42 inches diameter, or 48 inches if desired, and is made perfectly true on its face, being covered with the best packing. An arrangement is provided for fastening the paper on the disc to make a perfectly true and even surface.

An adjustable table is attached to the frame being placed at a right angle to the disc, allowing the shortest kind of stock to be squared up and giving a better finish than can be done any other way.

The Tight and Loose Pulleys are 12 inches in diameter and $6\frac{1}{2}$ inch face and should make 350 revolutions per minute.



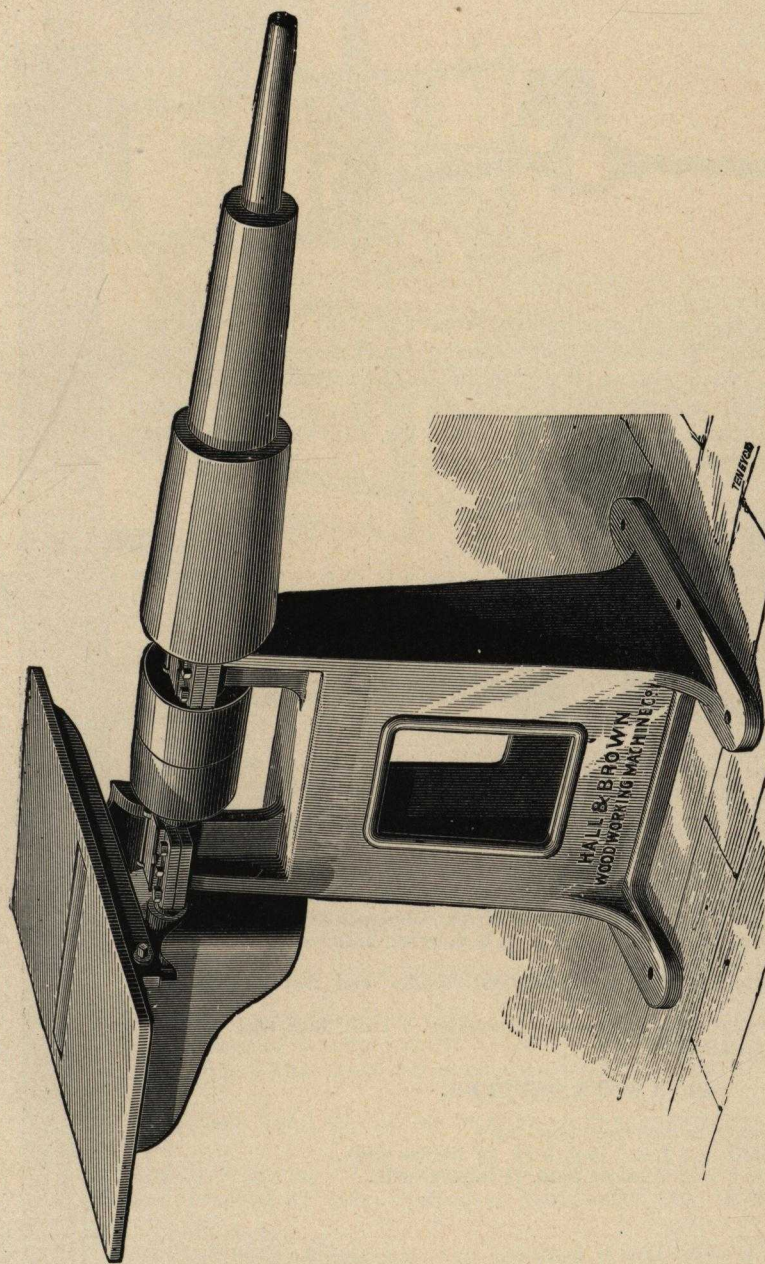
SPOKE AND HANDLE SANDER.

Weight, 650 lbs.

The above cut illustrates our new Iron Frame Sanding Machine. The machine is so well shown that it hardly needs describing. It is provided with a spring and treadle, so the operator can press the work on the belt with his foot, thereby saving much hard work for the hands and arms. The spring is adjustable on the frame so the work can be pressed on the belt in different places as the operator may wish, or it can be removed from the machine. The sand belt is tightened by the hand-wheel and screw. It is very simple, strong and durable, and occupies a space of about 2 feet 6 inches by 4 feet.

The Pulleys for the sand belt are 16 inches in diameter and 8 inch face. The longest length of sand belt that can be used is 10½ feet.

The Tight and Loose Pulleys are 6 inches in diameter and 4 inch face and should make 1100 revolutions per minute.



CONE SAND PAPERING MACHINE.

Weight, 600 lbs.

This is a very simple, efficient machine. Sand paper is cut to templets and the edges brought together and joined by glueing a strip of tough paper under them. When this has become dry the paper is slightly dampened everywhere except at the joint, and is then slipped on the taper drums. In drying it shrinks and becomes tight and smooth upon the rubber covering with which the drums are provided. These are of different sizes to fit different curves in the work.

Flat work is done upon the table. This is hinged and provided with an adjusting screw to regulate its height, and it can be raised to give access to the drum.

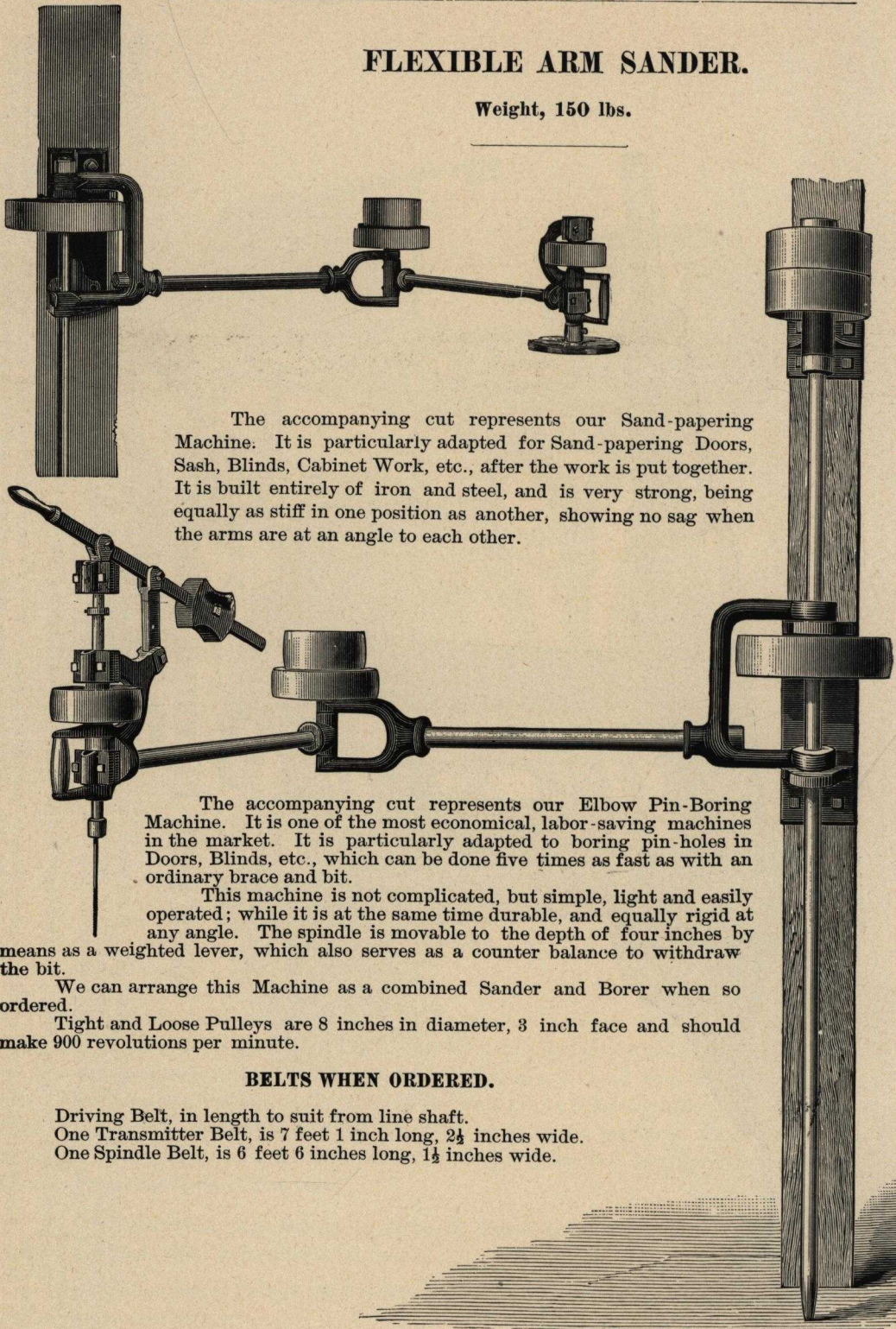
When sand-paper is applied in this way every grain is brought into contact with the work, whereas only the larger grains cut when it is used on the faces of revolving disks, as in some machines of this class. Furthermore, when used on drums it is offered ample opportunity to clear itself of dust, it therefore does not become clogged and, as a consequence, it lasts longer and does more and better work than when used on disks.

The drums are 12, 8, 5, and 3 inches in diameter, each 12 inches long, and the loose pulley is self-oiling.

Tight and Loose Pulleys 8 inches diameter, 4 inches face, and should make 800 revolutions per minute.

FLEXIBLE ARM SANDER.

Weight, 150 lbs.



The accompanying cut represents our Sand-papering Machine. It is particularly adapted for Sand-papering Doors, Sash, Blinds, Cabinet Work, etc., after the work is put together. It is built entirely of iron and steel, and is very strong, being equally as stiff in one position as another, showing no sag when the arms are at an angle to each other.

The accompanying cut represents our Elbow Pin-Boring Machine. It is one of the most economical, labor-saving machines in the market. It is particularly adapted to boring pin-holes in Doors, Blinds, etc., which can be done five times as fast as with an ordinary brace and bit.

This machine is not complicated, but simple, light and easily operated; while it is at the same time durable, and equally rigid at any angle. The spindle is movable to the depth of four inches by means as a weighted lever, which also serves as a counter balance to withdraw the bit.

We can arrange this Machine as a combined Sander and Borer when so ordered.

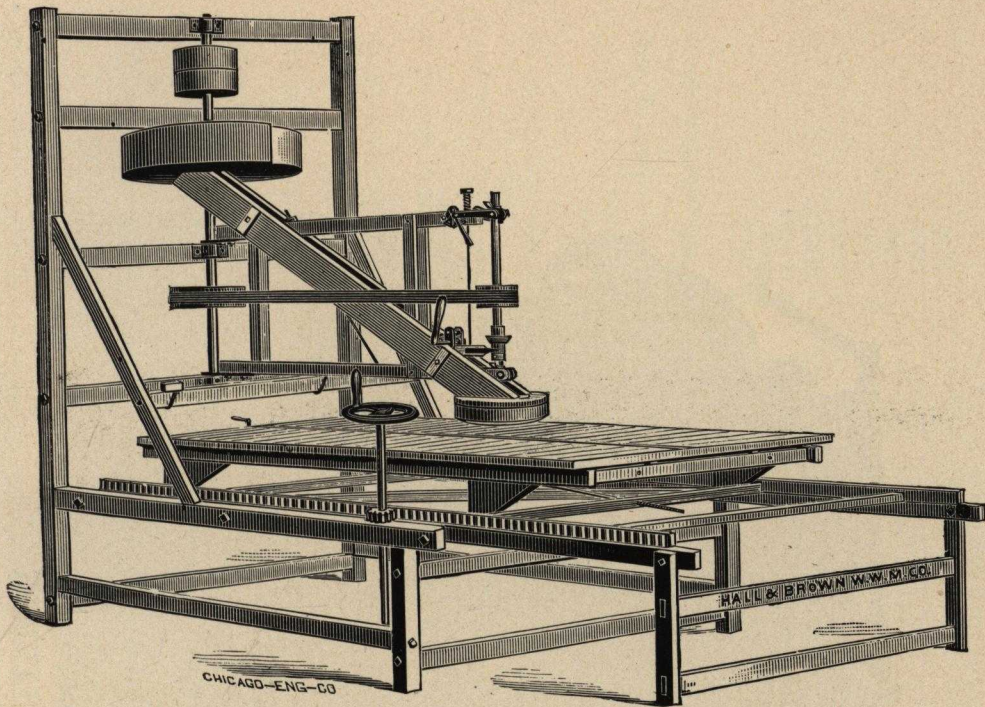
Tight and Loose Pulleys are 8 inches in diameter, 3 inch face and should make 900 revolutions per minute.

BELTS WHEN ORDERED.

Driving Belt, in length to suit from line shaft.

One Transmitter Belt, is 7 feet 1 inch long, 2½ inches wide.

One Spindle Belt, is 6 feet 6 inches long, 1½ inches wide.



"EUREKA" SAND-PAPERING MACHINE.

Weight, 700 lbs.

In this Machine the bed for holding material to be smoothed is movable endways by the use of a crank-wheel, cog pinion and rack, and can be quickly adjusted to any thickness.

The upright mandrel, to which the head which carries the sand-paper is attached, turns in adjustable boxes. These boxes are fastened to a crane, which swings over the bed from side to side. By moving a small lever, the upper end of mandrel is tilted right or left, as required for setting the head to correspond with the grain of the lumber which is being smoothed. The head is not flat, but slightly cone-shaped, and is counter-sunk two inches diameter in the center, so that when adjusted it does not grind with its entire surface, in the usual way, but has a cutting action from near the center outward.

The effect of this combination is a marked improvement in the quality, and great increase in the quantity of work which may be accomplished by the use of this machine, compared with others. The power required to run it does not exceed two horse-power—usually about one—and cheap labor may be employed.

Your attention is called to the following, among the many reasons why the "EUREKA" is superior to all others:

The rapidity and perfection of its work.

The nominal amount of power required to run it—not exceeding one horse.

The ease with which the head can be adjusted, while in motion, to smooth with the grain of the wood.

The facility with which the bed can be adjusted to any thickness of lumber, from one-half to eight inches.

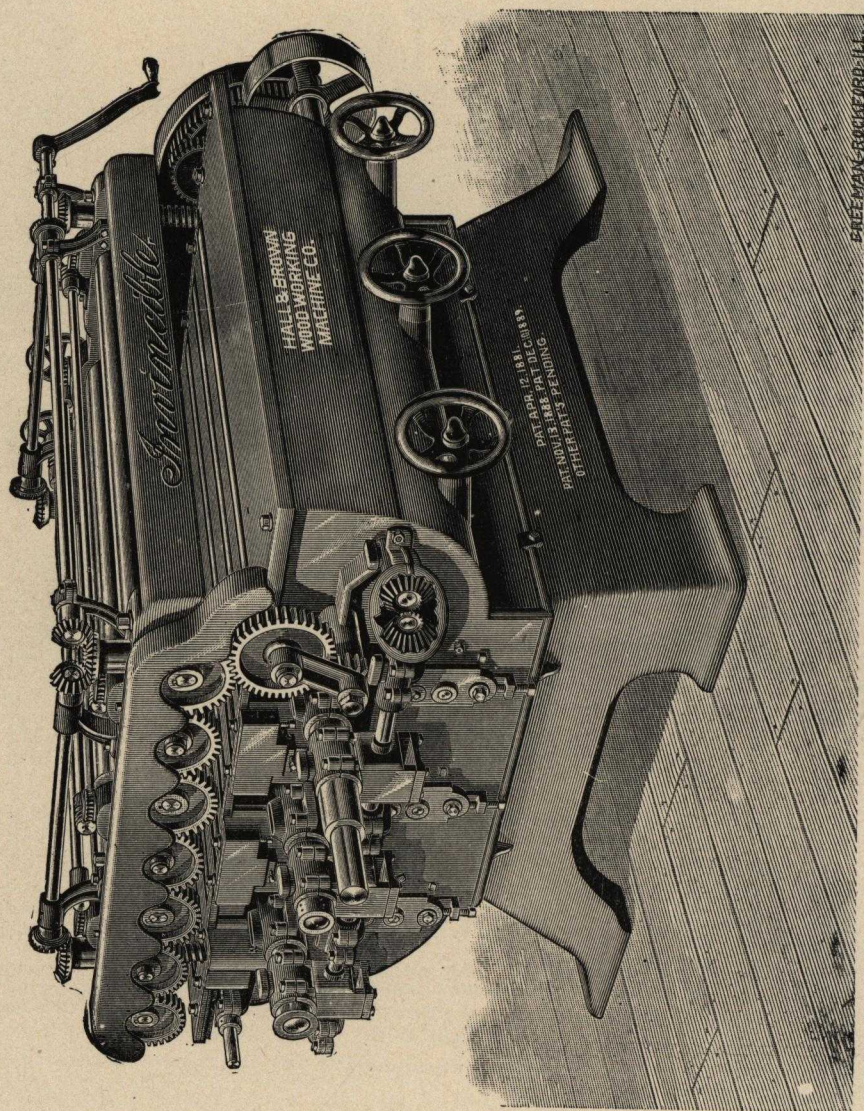
Its simplicity—requiring but little mechanical skill to operate it.

The use of rollers by which warped or bent lumber can be straightened and held in place.

The bed for holding the material to be smoothed, is both adjustable and movable, so that material of any length or width desired can be worked, depending only on the length and width of the machine used. Each machine is provided with an exhaust fan which carries away all dust produced by its operation.

For smoothing sash, doors, blinds and all plain surfaces of wood, it is unsurpassed by anything else yet invented for the purpose. It is especially adapted to the manufacture of wagon boxes.

The tight and loose pulleys are 10 inches in diameter and $3\frac{1}{4}$ inch face, and should make 1000 or 1200 revolutions per minute.

**INVINCIBLE SANDER.**

Invincible Sander.

In every detail the Invincible is simple, compact, easy to adjust, of great strength and durability, embodies many new principles, and produces work more perfect and uniform than can be done by hand.

THREE SAND CYLINDERS—The first, Cutting; second, Finishing; third, Polishing; are each independently adjustable, either while running or idle, to any desired cut by simply turning hand-wheels which are directly in front of machine. The cylinders are covered with a new kind of packing, which is very uniform and durable. The last is covered by a very soft, fine cushion for the paper, which just touching the work, imparts a very high polish.

ONE BRUSH CYLINDER—The brush cylinder is a very valuable acquisition to the machine, as it removes the dust from the finished work and keeps the last lower feed roll clean, which, if the dust sticks to, will mar the finished work.

THE PAPER FASTENER—We dispense entirely with screws and bolts for fastening the paper to the drums, using a device simple and positive, with provision for taking up the stretch which will occur. Every user will agree that the firmness with which paper is held determines its life. This feature alone is worth half the cost of the machine, and is one which no other manufacturer possesses.

TIME AND SAVING—We guarantee to put the sand paper on the drums in one-third the time heretofore required, and to save 25 per cent. of sandpaper over other machines; some manufacturers say one-half.

WIDTH OF PAPER—Forty inch covers either first or second cylinders, consequently no trouble to clothe Invincibles to any width, with standard sizes cut lengthwise.

THE OSCILLATOR is simple, fast, strong positive and durable. There is no lost motion or wear, as in all cam movements, consequently no jar or tremor to the machine. Every cylinder oscillates.

THE BED PLATES are very heavy, and are supported intermediately, making it impossible to break them or drum the stock.

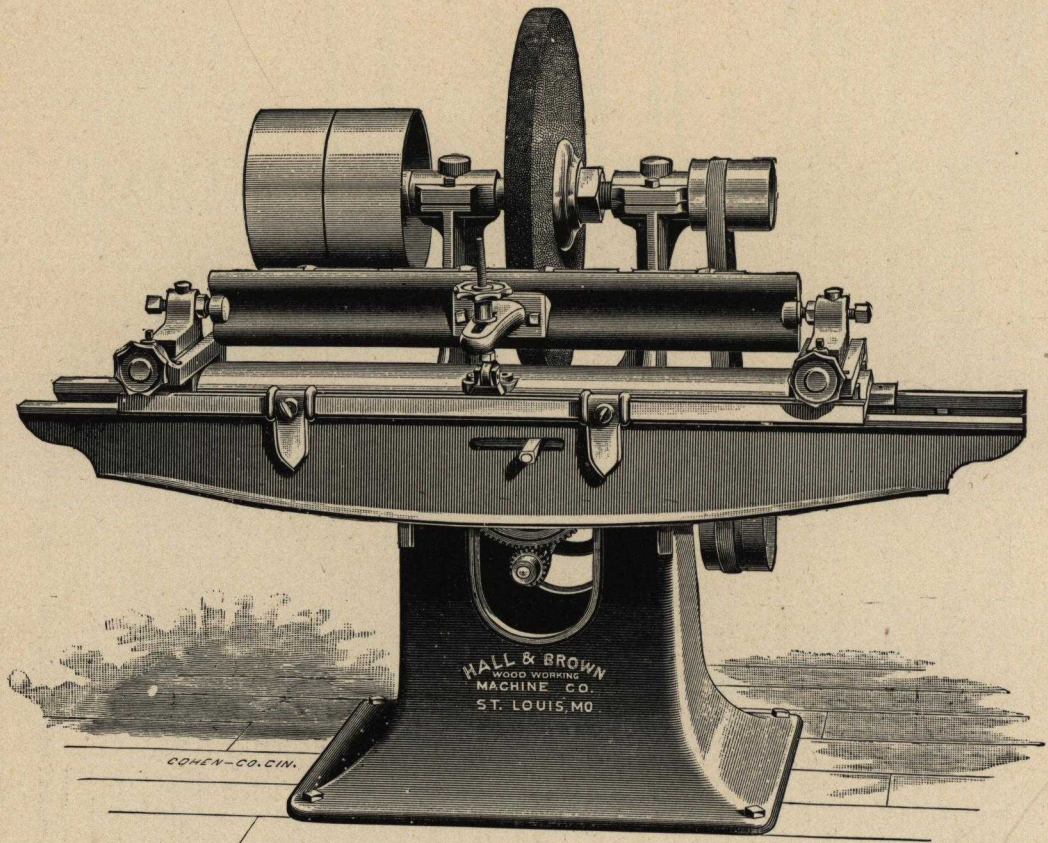
THE FRAME is compact and strong, and the whole machine is much heavier than any other Sander ever offered to the public.

EVERY PART is adjusted by screws, and locked as adjusted. Provision is made at every point to take up the wear. "Lagging," and "shimming up" are unknown in the Invincible, and has only one adjustment to change thickness of stock.

THIS MACHINE we make in the following seven sizes, or will make you one any reasonable width you may desire. We make them strong and substantial by equalizing the metal to give strength where most needed.

SIZE OF MACHINE.	T. & L. PULLEYS.	SPEED OF COUNTER.	FLOOR-ROOM REQUIRED.	SHIPPING WEIGHT.
24 inch.	14x 8	550	5 ft.x5½ ft.	4,400.
30 "	" "	"	" 6 "	4,700.
36 "	" "	"	" 6½ "	5,000.
42 "	" "	500	" 7 "	5,400.
48 "	" "	"	" 7½ "	5,900.
54 "	16x10	"	" 7 "	6,500.
60 "	" "	"	" 7½ "	7,200.

Hangers adjustable, and very heavy. Counter-shaft two and one-eighth inch, every shaft steel.



AUTOMATIC KNIFE GRINDER.

Disc Wheel. Weight, 750 lbs.

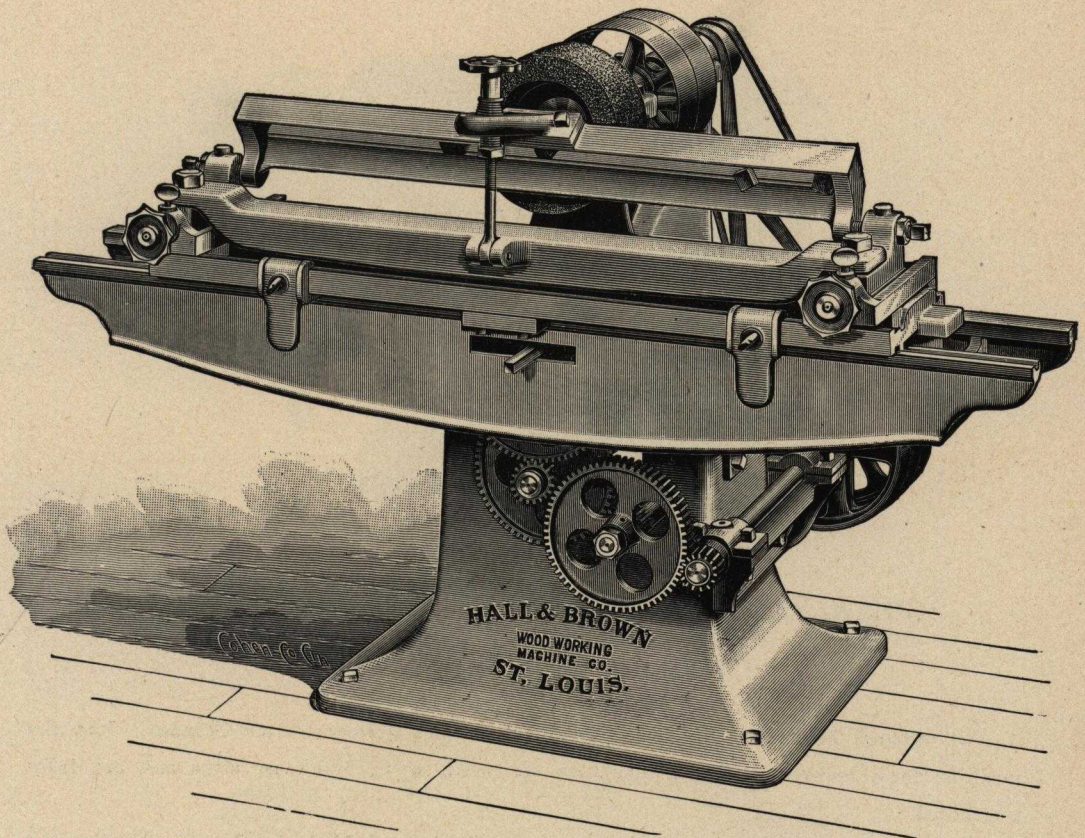
An Automatic Knife Grinder is something no Planing Mill can afford to be without. Most of the machines in use were too high in price, and many were compelled to grind their knives in a very imperfect manner on a grindstone. The above cut represents our Automatic Grinder, which recommends itself to every practical mill man as being both simple and durable.

The work can be done much quicker and better, and the knives will last much longer and be kept in better balance than if ground by hand. After the knife is bolted to the hold down bar of the machine and adjusted to the proper bevel desired and the machine started, it requires very little attention, and the knife will be ground perfectly true and straight.

The Emery Wheel we furnish with the machine is twenty-two inches in diameter and one and one-half inch face, and is made especially for this purpose, and can be used with or without water, as desired, and if run at the proper rate of speed given below, will not heat or draw the temper of the knife if the wheel is used dry. The frame or ways upon which the bed tracks, is well protected from the emery or dust from the wheel.

Our Standard machine will grind up to thirty-two inches in length, but we can build the machine to grind any length desired. The bed or platen upon which the knife is bolted can be instantly adjusted to traverse and return any distance from two inches to full length of knife.

The Tight and Loose Pulleys on the machine are 10 inches in diameter and three inches face, and should make 240 revolutions per minute.



AUTOMATIC KNIFE GRINDER.

Weight, 800 lbs.

The above cut represents our Automatic Knife Grinder, with cup or disc wheel. No Planing Mill is complete without an Automatic Knife Grinder of some kind, and as some mill men have an objection to the disc wheel it has induced us to construct a Machine with the cup wheel.

It is especially designed for grinding planer or other knives with a straight bevel and any width of bevel required and will grind any length of knife up to 32 inches. Machines suitable for longer knives will be made to order.

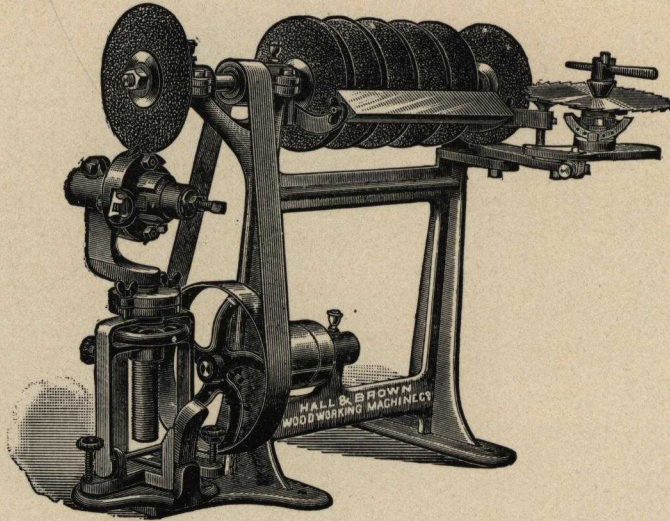
The frame is cast in one piece and has a large floor space. The carriage has a steady, even traverse motion, back and forth and is entirely automatic; little attention is required after once being started. The knife can be readily adjusted, the edge being raised or depressed to get the desired width of bevel.

The Emery Wheel is made expressly for this purpose and it can be run with or without water as desired.

The advantages of an automatic machine is that the machine will grind one set of knives while a duplicate set are in use. The knives will do better work by having a keen thin edge and the knives will be kept in balance by the bevels of each in the set being the same width, thereby securing a running balance.

It will pay for itself in a short time and no wood-working establishment can afford to be without one.

Tight and Loose Pulleys on this Machine are 8 inches in diameter and 3 inch face, and should make 600 revolutions per minute.



COMBINED BIT, SAW AND CUTTER GRINDER.

Weight of Complete Machine, 250 lbs.

Combined Moulding Bit, Tool, Circular Saw and Shimer Cutter Grinder. Just the machine for a tool room. These machines are gotten up in first-class style and are fully warranted.

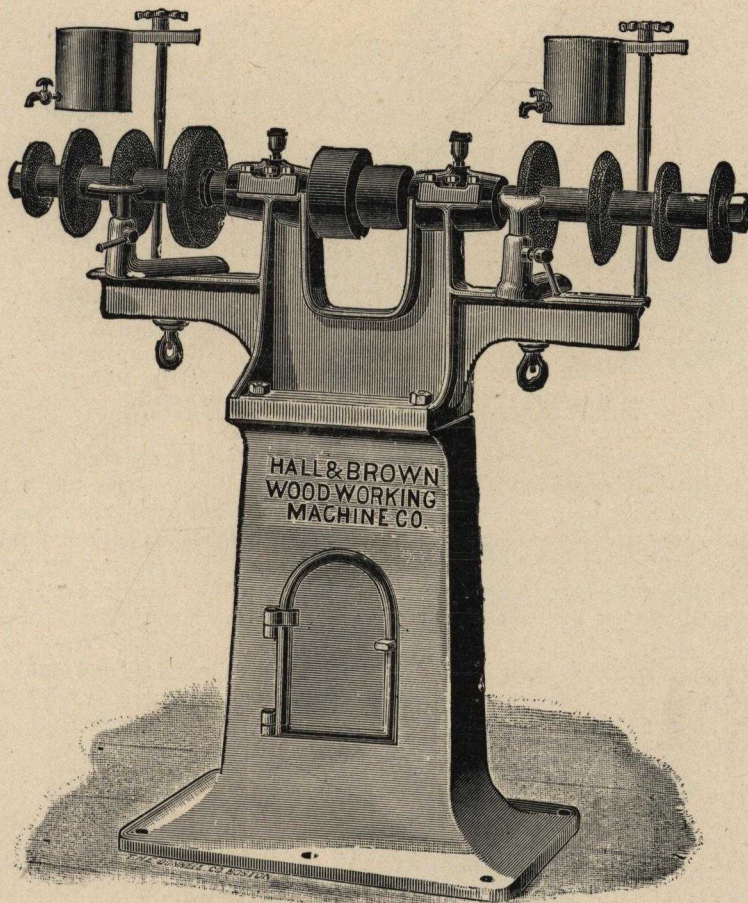
The Shimer head grinding attachment acts as a vice to hold the head while adjusting the cutters. It completes the work of sharpening, no files being used. There is nothing complicated about it, and it is quickly changed to suit any size of head or any angle or bevel on the knives. Not only does this machine do the work in much less time than it can be done by hand, but it keeps the cutters in good shape; the throats well cut out so as to give clearance for shavings, making the work easier on the head. This one attachment will pay for the machine in a short time in the item of time saving alone.

The Saw Gumming and Sharpening Attachment is very effective. It can be used for jointing the saw and simple stops, makes the teeth uniform, the hook and depth of all teeth the same, so that saws can be kept in first-class order with very little trouble.

As a tool grinder the gang of emery wheels needs no commendation. Every mill man knows how handy it is to have various shaped wheels always ready. The shape of faces of these wheels can be varied to suit special uses without extra charge.

We furnish with each machine one Emery Wheel, each $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$ and $\frac{3}{4}$, all 8 inches in diameter, also one wheel $8 \times \frac{3}{8}$ for the Shimer Bits and Saw Sharpener, when these attachments are ordered.

The Tight and Loose Pulleys are 4 inches in diameter and $2\frac{1}{4}$ inch face and should make 500 revolutions per minute.



EIGHT WHEEL GRINDER.

Weight, 500 lbs.

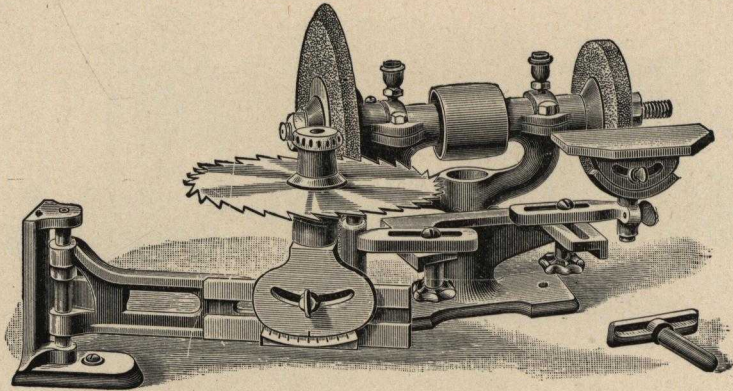
Very useful for grinding all kinds of cutters, knives and tools by means of solid emery wheels of various shapes, and up to 9 inches diameter.

The spindle runs in self-oiling boxes and has a two-step pulley, not for giving two speeds, but to enable the proper speed to be more easily attained.

The foot of the upper frame extends forward, forming a convenient shelf and providing a broad base to support the machine when placed on a bench.

The spindle pulleys are 4 and 6 inches diameter, 3 inches face, and should make 2000 turns per minute, for 9-inch wheels.

The counter-shaft generally has an 18-inch pulley for a 3-inch belt, and 9-inch self-oiling loose and tight for a 3-inch belt. For 9-inch wheels it should then make 445 turns per minute, if the belt be upon the large spindle pulley, or 335 if on the small one.

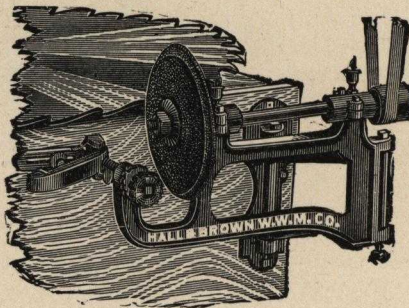


SAW GUMMER OR GRINDER.

Weight, 55 lbs.

This Machine is intended for Sharpening saws either Rip or Cross-cut, it can also be utilized for various other purposes such as sharpening Shimer Bits without removing them from the heads by having a plug or socket the right size to fit the head. It can also be used for grinding Moulder or Matcher Bits by using suitable face wheels for the purpose; for flat bevels the table can be tilted the proper angle. For Cross-cut Saws the Mandrel can be adjusted by one screw to get the proper incline or bevel for the teeth. One Emery Wheel furnished with each Machine.

Pulley on the Mandrel is three inches in diameter and $2\frac{1}{2}$ inch face and should make 1800 revolutions per minute. When counter shaft is ordered, unless otherwise advised it will be furnished with tight and loose Pulleys 8 inches in diameter, and $3\frac{1}{2}$ inch face, and 16 inch Driver, which should make 400 revolutions per minute.



SAW GUMMER.

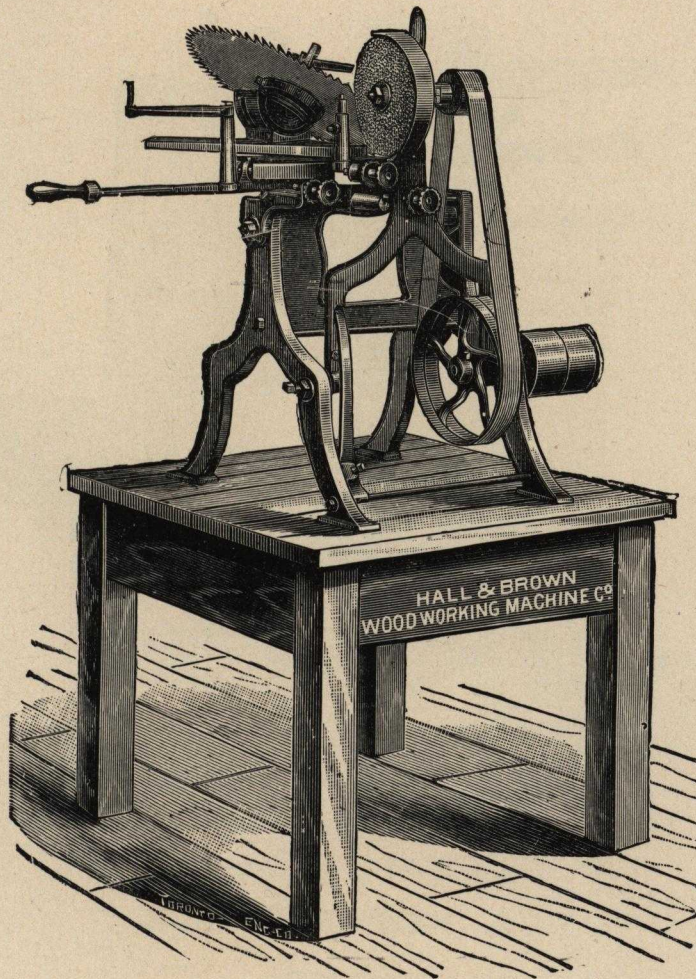
Weight, 78 lbs.

The above cut represents a simple and cheap Saw Sharpener, consisting of a frame with spindle, double pivotted hinge attached to bracket on table, also an adjustable chuck for holding the saws.

We furnish one Emery Wheel with each Machine.

Pully on Mandrel is $2\frac{1}{4}$ inch diameter, 2 inch face, and should make 200 revolutions per minute.

When counter shaft is ordered, unless otherwise advised it will be furnished with tight and loose Pulleys, 8 inch diameter and 3 inch face, with 14 inch driver and should make 350 to 375 revolutions per minute.

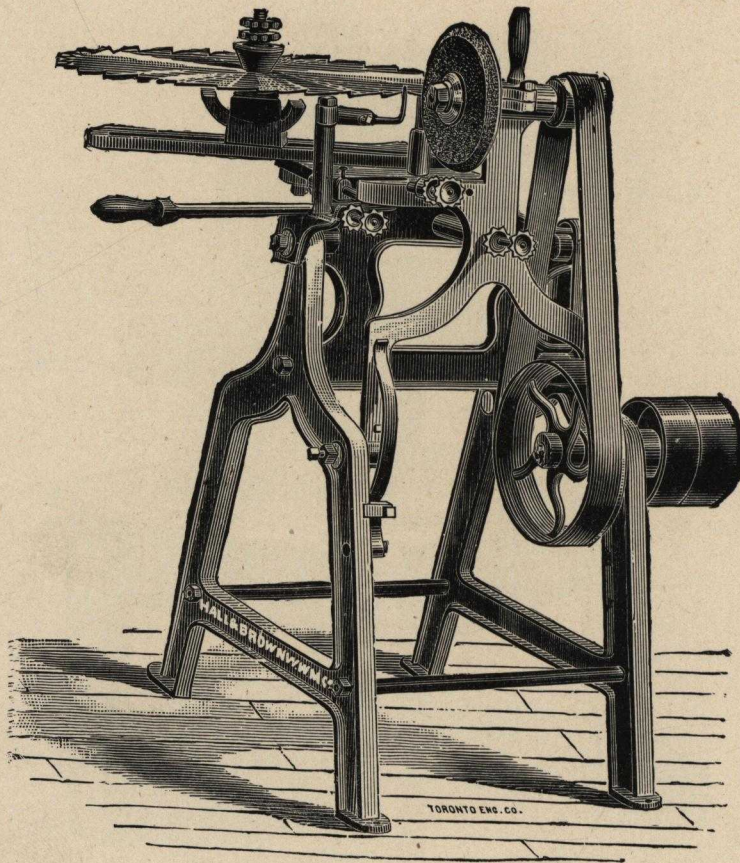


No. 1. SAW SHARPENER.

Weight, 100 lbs.

A Saw Sharpener is something that no factory, using saws, can afford to be without, as it saves time, power, files and saws and will do more and better work than when hand filed. The saws are then round and true, each tooth projecting the same distance from the center, and each tooth will do its share of the work. This Machine will sharpen saws from 6 to 40 inches in diameter. We can furnish it semi-automatic or entirely automatic as ordered; If so ordered we can furnish attachment for sharpening Band Saw Blades from $\frac{1}{2}$ to 3 inches wide. We furnish Mandrel Belt and three Emery Wheels with each Machine.

Driving Belt, when ordered 2 inches wide, in length to suit from line shaft. Tight and Loose Pulleys are 4 inches in diameter, and 2 inch face, and should make 900 revolutions per minute.



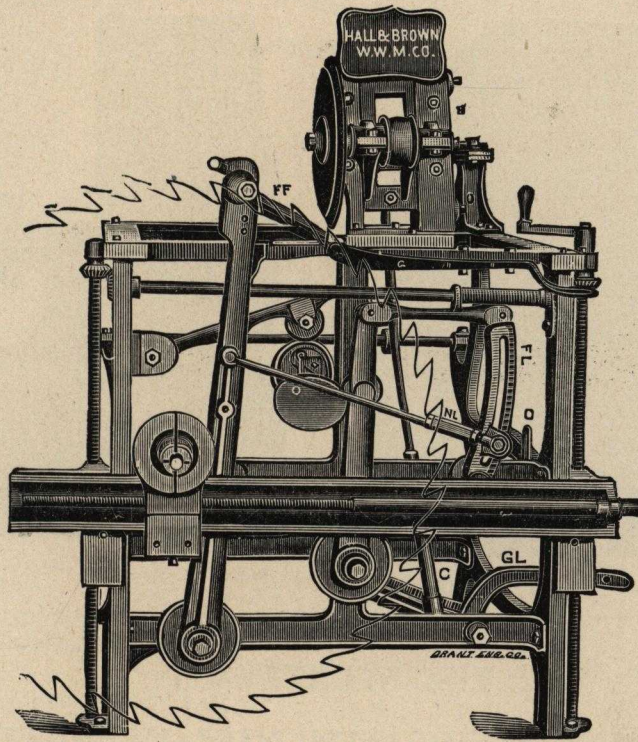
No. 3. SAW SHARPENER.

Weight, 380 lbs.

The above cut represents our No. 3 Sharpener which takes in saws from 8 to 72 inches, cross-cut or rip, and will sharpen small saws easily, as well as large. We can furnish an intermediate size Machine between the No's. 1 and 3. The No. 2 will sharpen Saws from 8 to 48 inches in diameter. In sharpening cross-cut saws on either Machine the Mandrel supporting the saw can be inclined to get the desired bevel. Either No. 2 or No. 3 can be furnished semi-automatic or entirely automatic as ordered. Either Machine will be furnished with gang saw attachment for sharpening straight gang saws, when so ordered.

We furnish the Mandrel belt and three Emery wheels with each Machine.

The driving belt should be two inches wide in length to suit from line shaft. The tight and loose pulleys on No. 2 and 3 Machine are 6 inches in diameter and $2\frac{1}{4}$ inch face and should make 600 revolutions per minute.



AUTOMATIC SHARPENER FOR CIRCULAR RIP SAWS.

Sharpens Saws from 8 to 72 Inches.

Weight, 800 lbs.

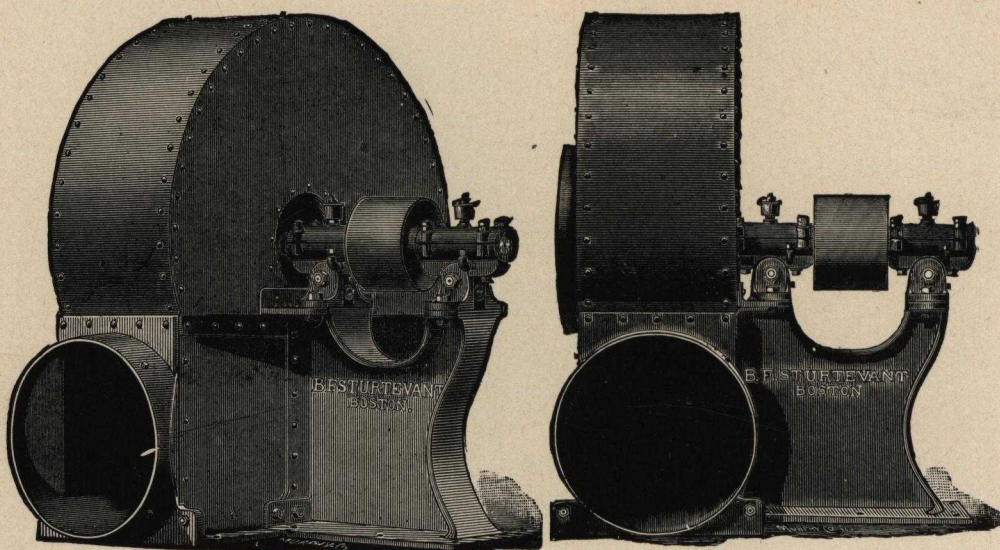
This Machine will be found a most perfect Sharpener for Circular Rip Saws. It will sharpen all kinds of inserted Tooth Saws complete without removing the points. It is entirely Automatic in all its parts. No saw mill can afford to be without a Sharpener of this description, as it does its work to perfection and no filing is required.

The above cut is a correct view of the different parts as they are now made showing the operating parts and the letters to be found on each piece.

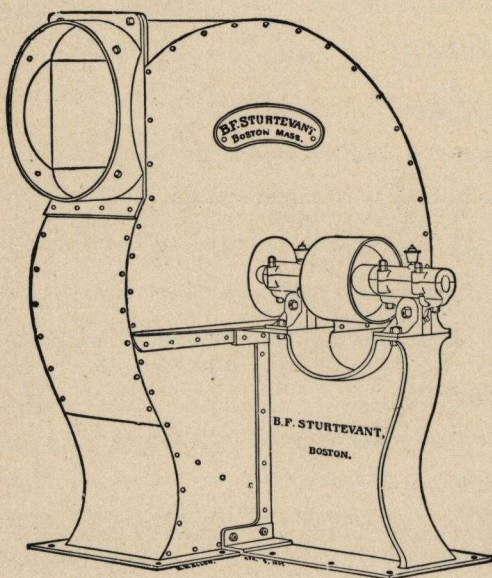
Full instructions will accompany each Machine, as to operation and adjustment.

A counter shaft is furnished with each Machine.

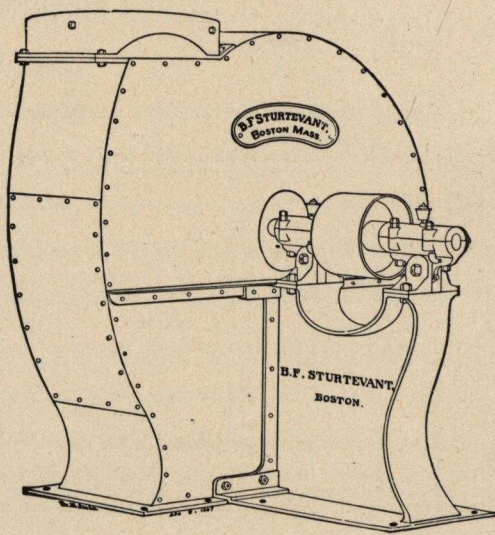
The Tight and Loose Pulleys are 12 inches in diameter and $2\frac{1}{2}$ inch face and should make 150 revolutions per minute.



**THE STURTEVANT
STEEL PLATE PLANING MILL EXHAUSTER.**



TOP HORIZONTAL DISCHARGE. (Right Hand.)



UP DISCHARGE. (Right Hand.)

The Sturtevant Steel Plate Planing Mill Exhausters.

Shells, Wheels and Shafts of Steel.

These Fans are expressly made for removing chips, shavings and sawdust from wood-working machinery. The shells of Exhausting Fans have been made heretofore, wholly, or in large part of cast-iron, with the hanger which supports the wheel, shaft and pulley, secured to the cast iron side of the Exhauster. The whole strain from the belt is thus thrown upon this thin, brittle plate of cast-iron, and any sudden strain, due to a large knot or piece of wood getting into the Exhauster, is liable to completely wreck both wheel and shell. To do away with this danger, we manufacture a full line of Exhausting Fans, in which the whole Machine, except the bottom plate, mouth piece and standard for the journal boxes, is made of STEEL, and the wheel shaft and pulley are supported by a standard with a broad base resting on the floor, thus removing all strain from the side of the shell, and providing a substantial support for the running parts of the Exhauster.

PRICES REDUCED 45½ PER CENT. FROM FORMER LIST.

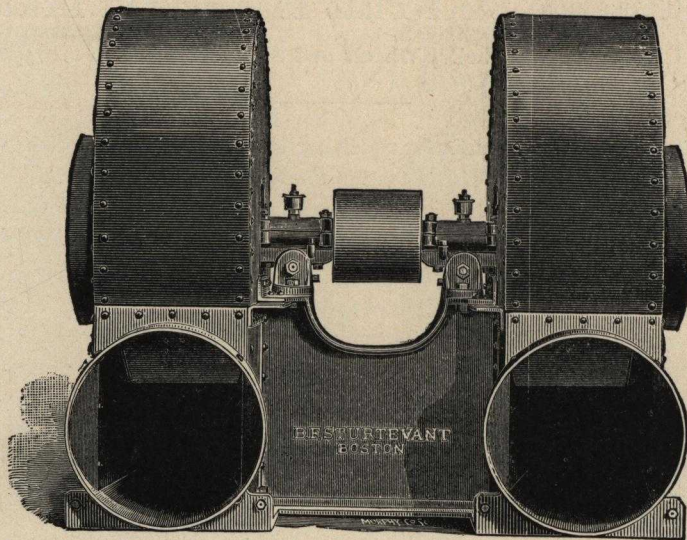
SIZES.	Height of Shell.	Outside Diameter of Inlet.	Outside Diameter of Outlet.	Diam. and Face of Pulleys.	Speed for Ordinary Work.	Speed for Heavy Work.	Shipping Weight.	PRICE.
30-inch.	30 inches.	11 inches.	11 inches.	5¼ x 5	2,200	2,600	315	\$44 00
35 "	35 "	13 "	13 "	6 x 6	1,800	2,200	420	55 00
40 "	40 "	15 "	14¾ "	6¾ x 6¼	1,600	1,900	638	70 00
45 "	45 "	17 "	16½ "	8 x 7½	1,475	1,750	784	90 00
50 "	50 "	19 "	18¾ "	8½ x 8½	1,300	1,550	910	115 00
55 "	55 "	21 "	20½ "	9½ x 9½	1,200	1,400	1,200	150 00
60 "	60 "	23 "	22¾ "	10¼ x 10	1,100	1,300	1,490	185 00
70 "	70 "	25¾ "	25¾ "	12 x 10½	950	1,100	1,785	250 00
80 "	80 "	30 "	30 "	13¾ x 11¼	800	950	1,950	325 00

The cuts upon opposite page show a RIGHT HAND Exhauster with BOTTOM HORIZONTAL DISCHARGE; upon the succeeding page are presented the TOP HORIZONTAL DISCHARGE, RIGHT HAND, and UP DISCHARGE RIGHT HAND.

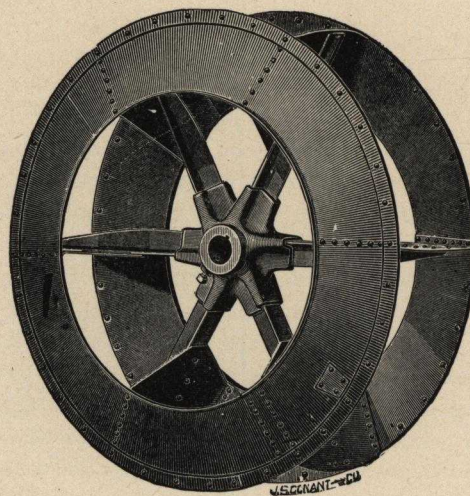
These Exhausters are made both RIGHT and LEFT HAND, in these three forms. The use of one of the special forms often does away with an extra bend in the delivery pipe, and reduces the floor space required. It will be noticed that when a cross belt is required to run a bottom horizontal, the substitution of a top horizontal will do away with this objection, and an open belt may be used, the air still being delivered in the same direction.

When ordering, or asking for estimates, state the character of the work to be done—whether wood is hard or soft, wet or dry; whether shavings are plenteous—long or short. State definitely the number, size and name of the Machines, and send a clear diagram showing exact distance from Machines to Exhauster; location of line shaft and direction in which the top turns; proposed location of Exhauster.

Be sure to state which hand Exhauster is wanted, Right or Left. By RIGHT HAND is meant pulley on right hand side as you stand facing the outlet, and by LEFT HAND, pulley on left hand side.



The Sturtevant Double Steel Plate Planing Mill Exhauster.



**The Sturtevant Steel Plate Planing Mill Exhauster
Blast Wheel.**

THE STURTEVANT DOUBLE STEEL PLATE PLANING MILL EXHAUSTERS.

**The Steel Plate Shells Obviate all Danger of Breakage by Blocks or Knots
Passing Through the Exhauster.**

The Blast Wheels in the single and double Exhausters are the same; they are made almost wholly of steel, which combines the minimum of weight with the maximum of strength and durability. The construction of these wheels is such as to enable them to produce blast or suction with the greatest economy. Everything being right, these fans will utilize 75 to 85 per cent of the power applied to them, only wasting 15 to 25 per cent in friction. We defy anyone to produce an Exhauster that will show better results than this. Ordinary Exhaust Fans do not utilize more than 40 to 60 per cent of the power applied.

The Journal Boxes are our improved patent Brush Oiler Pattern, and together with the journals are finished in the best manner, which insures running constantly at high speed without heating.

PRICES REDUCED 30 PER CENT FROM FORMER LIST.

SIZE.	Height of Shell.	Outside Diameter of Inlet.	Outside Diameter of Outlet.	Diameter and face of Pulley.	Speed for Ordinary Work.	Speed for Heavy Work.	Shipping Weight.	PRICES.
30-inch.	30-inches.	11 in.	11 in.	6½ x 6	2,200	2,600	472	\$ 80 00
35 "	35 "	13 "	13 "	7½ x 7	1,800	2,200	630	90 00
40 "	40 "	15 "	14¾ "	8 x 8	1,600	1,900	957	115 00
45 "	45 "	17 "	16½ "	9¼ x 9¼	1,475	1,750	1176	150 00
50 "	50 "	19 "	18¾ "	10½ x 10½	1,300	1,550	1365	200 00
55 "	55 "	21 "	20½ "	11¼ x 11	1,200	1,400	1800	250 00
60 "	60 "	23 "	22¾ "	12 x 11½	1,100	1,300	2235	300 00

GUARANTEE.

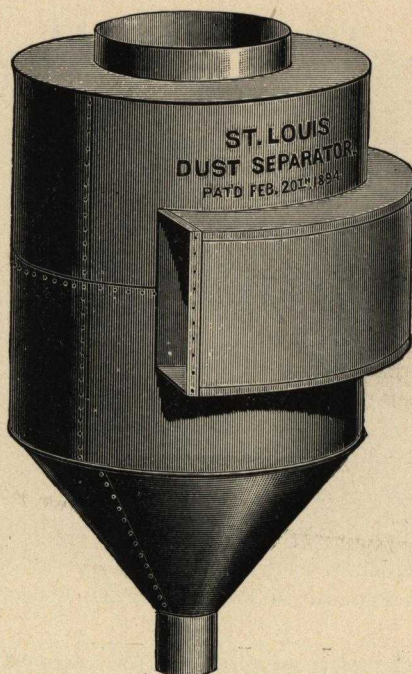
We guarantee that our Exhausters, when properly applied, will run with as little power—and as little noise—will do as much or more work in proportion to power used—are better proportioned—better made—more durable, and are sold at lower prices in proportion to size and capacity than those of any other make.

For certain positions a Double Exhauster is much to be preferred to a Single Exhauster. With the former, only a single belt and a single counter-shaft are required; less space is necessary, and when the exhaust pipes run in opposite directions they may be directly connected to the inlets of the fans (one upon either side) without the intervention of an elbow.

Double Exhausters are built either bottom or top horizontal or up discharge, and can be built to order in larger sizes than those given above. For dimensions, see Table of Principal Dimensions.

Attention is called to the instructions, under Single Exhausters, for ordering Planing Mill Exhausters.

Also read carefully the instructions for connecting our Exhausters with wood-working machinery on page 258.



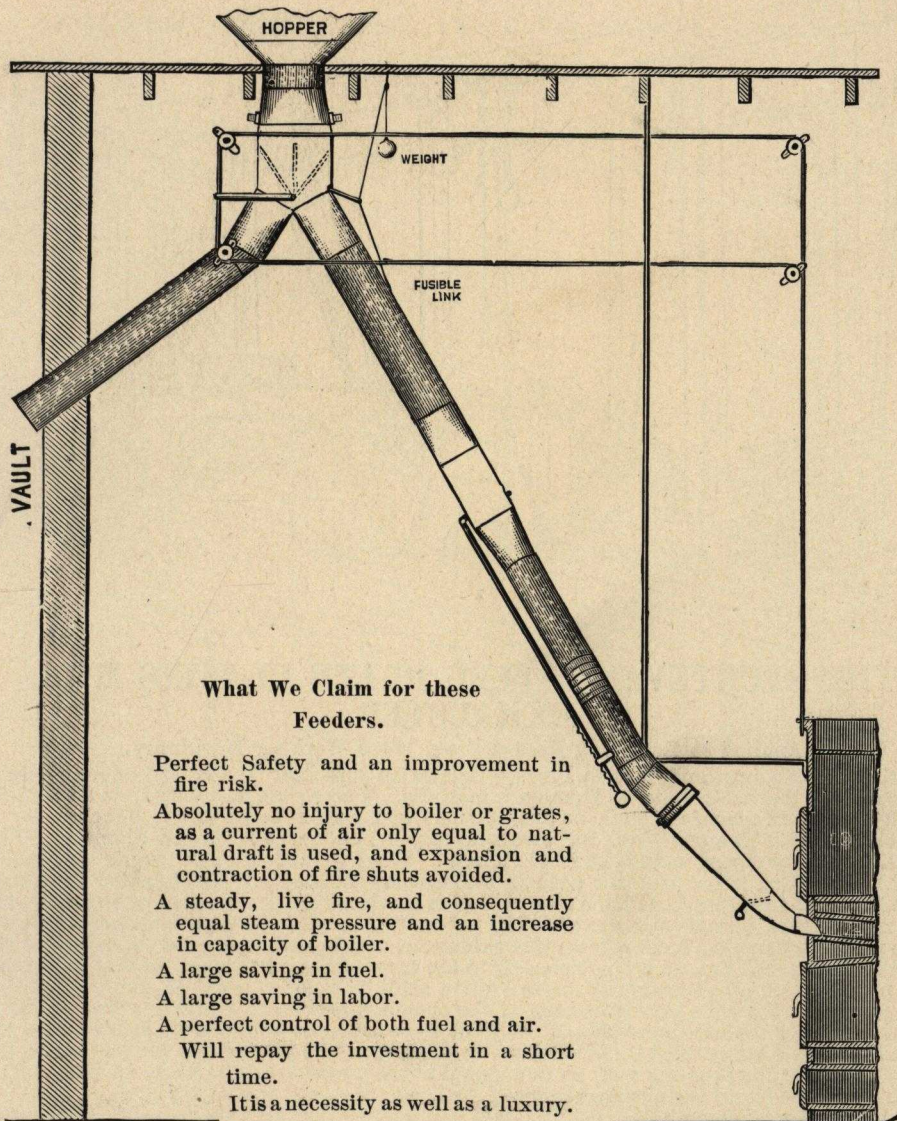
DUST SEPARATORS.

These Dust Separators, are manufactured from the best galvanized steel and are well crated so as to avoid all danger from shipping. They separate the air from dust and shavings, the air passing out of the top of the mechanism, while the dust and shavings drop to the fuel-room or by means of an automatic feeder delivered directly to the boiler fire.

In determining the size of the Separator necessary to be used with the Fan that has been selected, always take one the area of the inlet of which is one-half greater than the area of the outlet of the Fan. Place the Separator upon the roof of the fuel room with the lower hopper sunk about half way into the roof, being particular that the Separator sets perfectly level and that at least the last ten feet of pipe next to the Separator runs straight and is on a level with the inlet of the Separator. If the precautions are properly taken the Separator will always work well and can be used for years without repairs of any kind. Every plant of this and all other kinds sent out by this Company is fully warranted and always works successfully.

DIMENSIONS.

No.	Diameter of Discharge Pipe where it enters the Vault.	Area of Inlet of Arrestor in square inches.	Diameter of Arrestor.	Height of Arrestor.	Weight.
1	10 in.	78 in.	36 in.	84 in.	150
2	12 in.	113 in.	38 in.	85 in.	165
3	14 in.	154 in.	48 in.	87 in.	195
4	16 in.	201 in.	48 in.	87 in.	215
5	18 in.	254 in.	54 in.	90 in.	235
6	20 in.	314 in.	54 in.	90 in.	255
7	22 in.	380 in.	56 in.	94 in.	280
8	24 in.	452 in.	56 in.	94 in.	300
9	26 in.	530 in.	60 in.	96 in.	325
10	28 in.	615 in.	60 in.	96 in.	350
11	30 in.	706 in.	66 in.	100 in.	370
12	34 in.	908 in.	66 in.	100 in.	400
13	36 in.	1018 in.	72 in.	108 in.	420
14	40 in.	1257 in.	74 in.	108 in.	460



What We Claim for these Feeders.

Perfect Safety and an improvement in fire risk.

Absolutely no injury to boiler or grates, as a current of air only equal to natural draft is used, and expansion and contraction of fire shuts avoided.

A steady, live fire, and consequently equal steam pressure and an increase in capacity of boiler.

A large saving in fuel.

A large saving in labor.

A perfect control of both fuel and air.

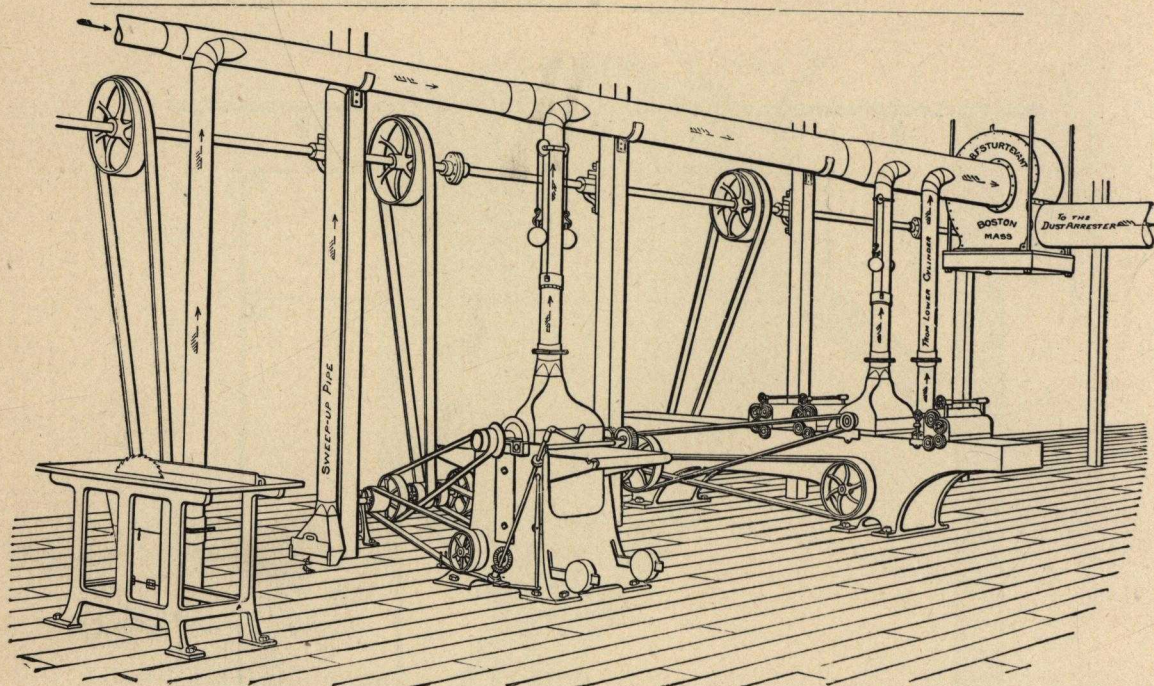
Will repay the investment in a short time.

It is a necessity as well as a luxury.

FURNACE FEEDER.

The above cut shows a side view of our Boiler Patent Furnace Feed. These Feeders are constructed of the best galvanized iron, all riveted and soldered, and are supplied with patented valves, nozzles and automatic safety valves, and all adjustments necessary to control perfectly the quantity of fuel fed to either or both furnaces or the vault, and also to regulate the current of air fed with the fuel. These feeders are attached directly to the hopper of the dust separator, and the fuel is fed through the pipes automatically, and the only attention required is an occasional shift of a valve or adjustment by the fireman. There is no fuel scattered on the floor between the furnaces and the vault, and thus one of the greatest dangers from fire is removed. We have feeders to four furnaces, operated by one man, where two and three were originally required, thus saving labor. They deposit the fuel on the grates in a direction natural to the draft of the furnace, thus avoiding all danger of back draught, when the furnace doors are opened, and the automatic safety valve is the only device that operates as a safeguard against fire without the attention of the fireman. Only enough air should be fed with the fuel to deposit it on the centre of the grates, so as to avoid injury to the grates. By always keeping furnace doors closed, the expansion and contraction of the fire sheets is avoided and a steady, live fire, and consequently an even steam pressure, is obtained. By feeding a small quantity of air with the fuel more perfect combustion is secured, and, consequently, a saving in fuel.

Full directions for taking measurements, erecting and operating, furnished upon application.



THE STURTEVANT STEEL PLATE PLANING MILL EXHAUSTER.

Applied to Removing Refuse From Wood-Working Machinery.

Size of Exhauster and Suction Pipes.—Determine separately the most economical size of pipe to remove the waste material from each machine. These sizes will vary from 3 to 5 inches diameter for small machines, such as buzz-planers and cut-off saws, to 7 to 8 inches for the largest machines. The usual size for sweep-up pipes is about 6 inches in diameter. These dimensions are for pipes less than 25 feet in length. When they exceed this length, the diameter should be increased 10 per cent. for each 20 feet increase in length. Add together the areas of all the branches thus found, and the sum will give the least admissible area of the main pipe. It is best, however, to make the size about 20 per cent. in excess of that calculated in this way. As the main suction pipe recedes from the exhauster, and branches are taken out from it, it should be diminished in area proportionately to the areas of these branches, so that at any point in the main suction pipe the area of cross suction shall be at least equal to, and preferably 20 per cent. greater than the aggregate area of the openings beyond; i. e., further away from the fan. The inlet of the exhauster should be of the same diameter as the main suction pipe after all the branches have entered it. Therefore, to determine the proper size of fan, select from the list of exhausting fans one with an inlet equal to the diameter of the main suction pipe; or if such cannot be found the one next larger.

Advantages of Double Exhausters.—It is well known that fans are more effective in small than in large diameters; i. e., that a small fan will, for its size, do more work than a large one.

For this reason it is often advisable to substitute a double for a single exhauster. A double also possesses other advantages over two single exhausters, and should always, when possible, be used in their stead. With the double exhauster only one belt and counter-shaft is required, much less space is occupied, smaller and shorter pipes can be used, and, above all, return bends in the pipes are avoided, for there is an inlet in the outer side of each fan. On account of this arrangement they may be much more readily placed centrally among the machines.

Location of Exhauster.—The exhauster should be placed nearest to the heaviest work; but nevertheless, so far as convenient, centrally with regard to all the machines. If the machines are so far apart that the branches must exceed 50 feet in length, it is more economical to increase the number of fans, (preferably by using double exhausters) until they are brought within reasonable lengths.

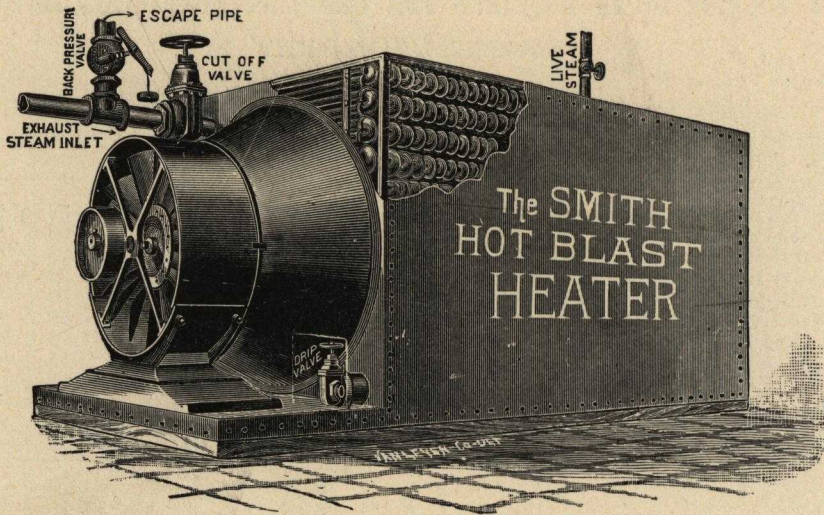
Discharge of Exhauster.—The Sturtevant Exhausters are built to discharge in three different directions (as shown elsewhere); either horizontally at the bottom or top, or vertically upward, and are designated respectively, as bottom horizontal, top horizontal, and up-blast discharge. In each case the bottom of the blast wheel inside the exhauster, travels toward the outlet. The object of these various discharges is to avoid a cross-belt from counter or main line to the exhauster. Note the direction in which the main line runs, and then choose such an exhauster as will avoid the use of a cross-belt. If a bottom horizontal requires a cross-belt, then a top horizontal may be run with an open one, and vice versa.

**SIZE OF SUCTION PIPES REQUIRED FOR ORDINARY SURFACERS, MATCHERS,
MOULDERS, SAWS, ETC.**

NAMES OF HOODS.	SIZE OF PIPES.	AREA OF PIPE.
Surface Top Head, 24 to 30 inch.....	7 in. Diam.	38 sq. inches.
Surface Lower Head, 24 to 30 inch.....	6 "	28 "
Matcher Top Head, 7 to 14 inch.....	6 "	28 "
Matcher Lower Head, 7 to 14 inch.....	6 "	28 "
Pony Planer Top Head, 20 to 24 inch.....	5 "	20 "
Moulder Top Head, 7 to 9 inch.....	6 "	28 "
Moulder Bottom Head, 7 to 9 inch.....	5 "	20 "
Moulder Side Heads, 7 to 9.....	2—4 "	25 "
Tenoner.....	6 "	28 "
Saws, 10 to 16 inch.....	4 "	12 "
Saws, 18 to 30 inch.....	4½ "	16 "
Saws, 36 to 60 inch.....	5 "	20 "

TABLE OF AREA, CIRCUMFERENCE AND WEIGHTS OF PIPE.

Diameter in In-ches.	Area in Square Inches.	Circumference in Inches.	Weight in Lbs. per Foot.	Gauge of Iron.	Diameter in In-ches.	Area in Square Inches.	Circumference in Inches.	Weight in Lbs. per foot.	Gauge of Iron.
3	7.0	9.4	1	24	30	707	94	23	16
3½	9.6	11.0	1½	24	31	755	97	24	16
4	12.5	12.6	1¾	22	32	804	100	24½	16
4½	15.9	14.1	1¾	22	33	855	104	25	16
5	19.6	15.7	2	22	34	908	107	26	16
6	28.2	18.8	2½	22	35	962	110	27	16
7	38.5	22.0	3	22	36	1018	113	28	16
8	50.2	25.1	3¾	22	37	1075	116	29	16
9	63.6	28.3	3¾	22	38	1134	119	30	16
10	78.5	31.4	5	20	39	1195	122	31	16
11	95.	34.6	5½	20	40	1257	126	32	16
12	113.	37.7	6	20	41	1320	129	32½	16
13	133.	40.8	6½	20	42	1385	132	33	16
14	154.	44.	7	20	43	1452	135	34	16
15	177.	47.	7½	20	44	1520	138	35	16
16	201.	50.	8	20	45	1590	141	36	16
17	227.	53.	8½	20	46	1662	144	37	16
18	254.	57.	9	20	47	1735	148	38	16
19	284.	60.	9½	20	48	1810	151	39	16
20	314.	63.	13	18	49	1888	154	40	16
21	346.	66.	13½	18	50	1964	157	41	16
22	380.	69.	14	18	51	2043	160	42	16
23	415.	72.	14½	18	52	2124	163	43	16
24	452.	75.	15¼	18	53	2206	166	44	16
25	491.	79.	16	18	54	2290	170	45	16
26	531.	82.	16½	18	55	2376	173	46	16
27	573.	85.	17¼	18	56	2463	176	47	16
28	616.	88.	18	18	57	2552	179	48	16
29	661.	91.	19	18	58	2642	182	49	16



SMITH HOT BLAST APPARATUS.

Shipped set up Complete, with Valve ready for operating with either Live or Exhaust Steam.

The above cut illustrates the Smith Hot Blast Apparatus as used for heating and ventilating, and the rapid drying of all kinds of lumber and other material such as brick, leather, cotton, hemp, salt, sugar, fruit, grain, tobacco, textile fabrics, excelsior, etc., in fact, all substances from which moisture is to be removed. Drying is erroneously supposed by many to be a difficult matter, more because they do not know the simple laws by which it is accomplished, than from lack of experience. Such is not the case as more material can be thoroughly dried by a rapid movement of cold air than can be dried by very high temperature with no circulation, and by raising the temperature of the air we increase its effectiveness, and in this lies the secret of the Hot Blast Apparatus. This system of heating and drying has secured the endorsement of all Insurance Companies and authorities generally, and all who are interested in this direction.

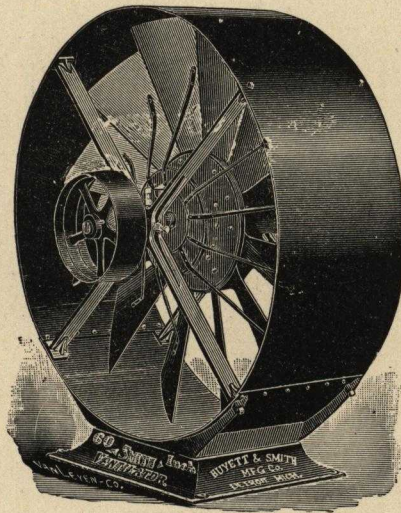
The wheel of this fan is of the lightest, as well as the strongest, possible construction, which insures the most efficiency with the least amount of power. A moderate velocity with great volume of air blast is invariably the requirements in heating, ventilating or drying. The heating coils of pipes are arranged horizontally and enclosed in a wrought iron jacket and are self-draining, and the cold air being forced through the enclosure is heated by the coiled steam pipe: the air so heated is thereby forced through the distributing pipes for the purpose of drying, heating or ventilating mills, factories or other buildings. No fire can result from using this system of heating, it cannot be frozen up in the coldest of weather if the drip cock is left open, and when once in operation requires little or no care. The apparatus is constructed for using exhaust steam from the engine, but live steam can be used, either one or both at the same time. By using exhaust steam the heating or drying process is reduced to a minimum. The steam trap checks the flow when live steam is used. This apparatus is made entirely of wrought and cast malleable iron and is self-draining and anti-freezing and never springs a leak.

By using this system a constant change of air is obtained throughout, rendering the air pure and free from unwholesome odors produced in many kinds of manufacturing.

The small amount of power required to drive the fan and the avoidance of the necessity of repairs and steam pipes located throughout a building, as is the case with direct steam heating, should be considered.

We can furnish this apparatus with engine attached suitable for driving the fan, when desired.

THE SMITH VENTILATOR FAN.



For delivering fresh air in, or removing foul air, gas, steam, smoke, etc., from factories, basements, engine and boiler rooms, etc.

Best known appliance for all places where ventilation is desired or fresh air is to be supplied, or where a large volume of air is required at a moderate speed.

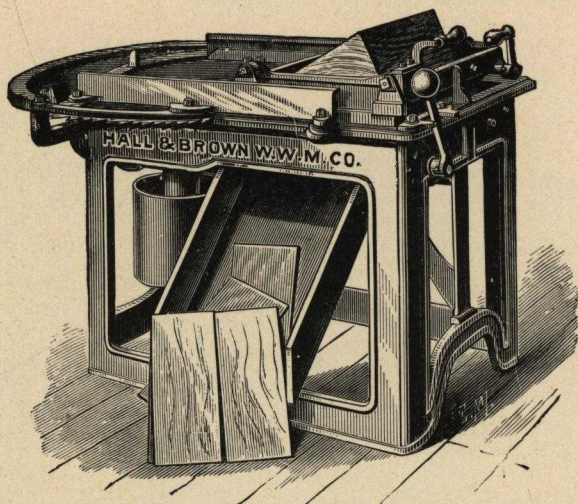
We Claim that the "Smith" Fan is the Best.

- 1.—Best design and finish, and strongest throughout; can be placed and operated in any position, horizontal, perpendicular or otherwise.
- 2.—It can be piped to conduct the air to any desired place by simply slipping the air conducting pipe over the outside of the shell or case of the Fan.
- 3.—It will draw air from or push air to desired place, through same pipes, by simply reversing the belt, delivery being as positive either way.
- 4.—When piped to "Dry Kilns," or any place where considerable pressure, friction or resistance to the passage of the air occurs, it will push forward the air against a back pressure of four ounces to the square inch, without loss by back-lash through the centre of the wheel. We challenge competitors to show a disc or wheel ventilator of the same class that will deliver air against one-fourth this pressure without loss by back-lash.
- 5.—It will discharge more cubic feet of air per horse power applied, where there is resistance to overcome, than any Ventilator Fan of its class.
- 6.—Wheel is enclosed by a case, which acts in combination with wheel; it also prevents accidents, which often occur with wheels not protected by casing.
- 7.—It is noiseless in operation and is an ornament in any factory, theatre, hotel, vessel, mill, office or any place where it may be located.
- 8.—It costs 25 to 50 per cent. less than other wheel or disc ventilators of the same capacity, and it can be operated with as little power.

Prices of the Smith Ventilator Fan.

Sizes.....	18 Inches.	24 Inches.	34 Inches.	42 Inches.	48 Inches.
Diameter and Face of Pulley.....	4 x 2½	6 x 3½	8 x 3½	10 x 3½	12 x 4½
Size of Base.....	13½ x 12	20 x 16	22 x 22	24 x 28	24 x 28
Height of Base.....	3½ inches.	4½ inches.	5 inches.	5 inches.	5 inches.
Revolutions per Minute.....	1,300 to 1,800	1,000 to 1,500	800 to 1,000	600 to 900	500 to 800
Capacity in Cubic Feet of Air per min.	6,000	10,000	20,000	30,000	40,000
Price.....	\$40 00	\$50 00	\$75 00	\$100 00	\$125 00
Weight.....	90 lbs.	125 lbs.	200 lbs.	300 lbs.	350 lbs.

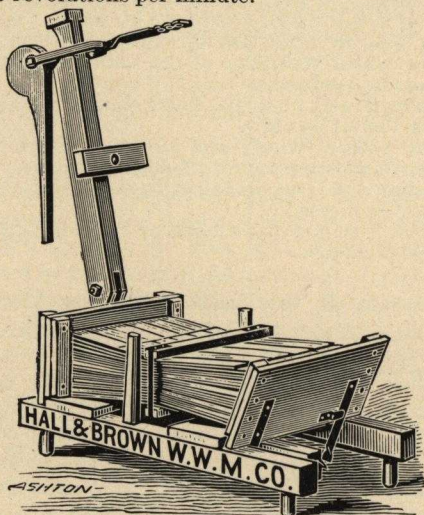
Sizes.....	60 Inches.	72 Inches.	84 Inches.	96 inches.
Diameter and Face of Pulley.....	14 x 4½	16 x 5½	18 x 6½	20 x 6½
Size of Base.....	28 x 38	28 x 38	No Base.	No Base.
Height of Base.....	5 inches.	5½ inches.	No Base.	No Base.
Revolutions per Minute.....	350 to 500	300 to 450	260 to 400	225 to 350
Capacity in Cubic Feet of Air per min.	60,000	85,000	120,000	150,000
Price.....	\$260 00	\$275 00	\$375 00	\$475 00
Weight.....	550 lbs.	700 lbs.		



THE VICTOR SHINGLE SAWING MACHINE.

Weight, 1,000 lbs.

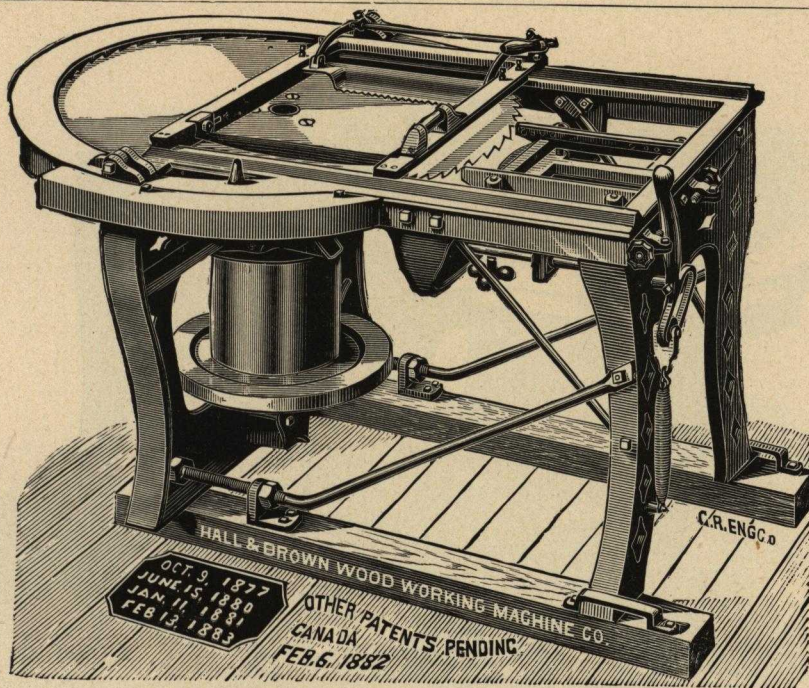
In order to meet the popular demand for a very low priced, yet efficient machine for sawing shingles, short heading, pail bottoms, box boards, and other short thin stuff, we have designed the machine of the horizontal class shown in the above cut. It has a well-designed iron frame and will take a saw up to 38 inches in diameter. It is fitted up in every respect equal to our large machines, but the patterns have been designed with the special view of reducing the cost of production very much, so that we are enabled to offer it to the public at a very low price. The machine has very convenient arrangement for shifting the gauge for points and butts of shingles. The saw is well guarded, and is easily and quickly removed from and replaced in the machine. It takes but very little room and power, and is adapted to meet the wants of a large class. It is very compact and can be very conveniently transported at a distance from railroads, and is well adapted to mills. It has a high capacity, and its running parts are very strong, so that saws of light gauge can be used and a saving of time effected over larger machines. Horse power required, about 6. We also make machines of this style that will take 40-inch saws and larger, which are adapted to sawing either heading or shingles. The Driving Pulley is 12 inches diameter and 10½ inch face, and should make 1400 to 1600 revolutions per minute. When counter shaft is ordered unless otherwise advised it will be furnished with Tight and Loose Pulleys 12 inches in diameter and 10 inch face, with 26 inch drive Pulley and should make 650 to 700 revolutions per minute.



SHINGLE BUNCHER.

Weight, 100 lbs.

One movement of the lever presses the bunch from both sides. The bunches are 20 inches wide and 30 inches long.



EVARTS' SHINGLE MACHINE.

Weight for 36 Inch Machine, 900 lbs. Weight for 42 Inch Machine, 1400 lbs.

Carriage is lighter and stronger, having a patent wrought iron frame with forged cast steel head and tail dogs. Brass slides, side wear of carriage on ways and movable dog adjustable, dog has $2\frac{3}{4}$ -inch throw. Carriage is very shallow, so that bolt is easily placed on tilt table, and spalt readily removed. No cross-girt to prevent sawyer assuming a natural position while sawing.

DESCRIPTION OF THE PERKINS' "EVART'S"

The Machine is an exact duplicate of the Michigan Favorite and the Grand Triumph, except it has the regular Evart's tilt table in place of the one-screw Perkins, and no side rollers on carriage or lignum vitæ bearings or arbor with solid steel head. In other respects it is the same. By these changes we have greatly reduced its cost, and aside from the two machines named, it has no equal.

Improvements on the other style of machine cannot be applied to the "Evart's."

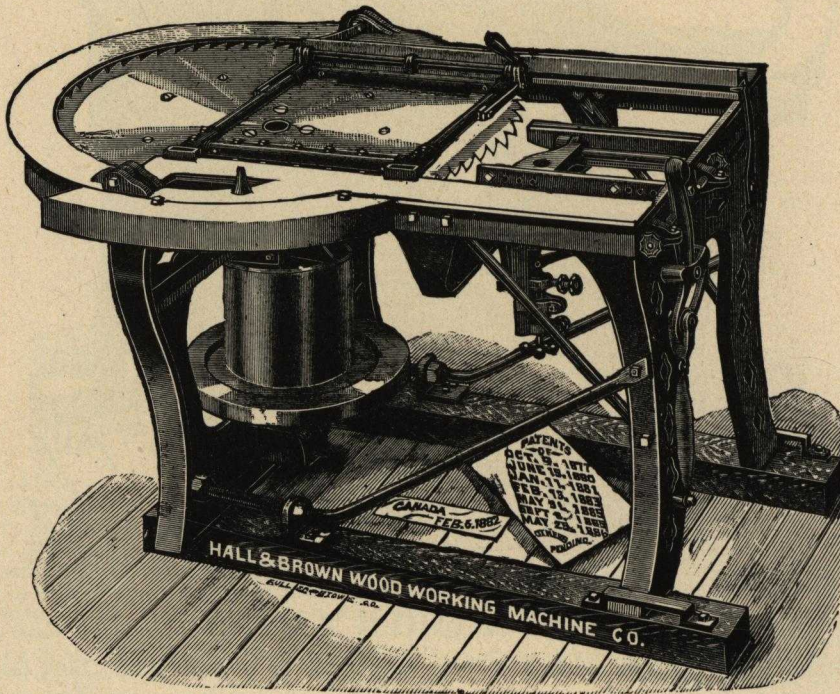
We feel justified in stating that if customers are determined to have a cheap machine, they cannot do better than to buy the Perkins' "Evart's."

For 16, 18 and 26 inch stock it will be furnished without balance wheels unless otherwise specified.

Pulley on the Mandrel of 36-inch Machine is 12 inches in diameter and 8 inch face and should make 1800 revolutions per minute. Pulley on the Mandrel of the 42-inch Machine is 14 inches in diameter, 10 inch face and should make 1600 revolutions per minute.

Shingles from 16 to 19 inches long can be cut on 36-inch Machine. Shingles from 16 to 26 inches long, can be cut on the 42-inch Machine.

The 36-inch Machine should be driven by a 43x8 Pulley on line shaft making 500 revolutions per minute. The 42-inch Machine should be driven by a 41x10 inch Pulley on line shaft making 500 revolutions per minute.



MICHIGAN FAVORITE, ONE SCREW TILT SHINGLE MACHINE.

Weight with 38 inch Saw, 1120 lbs., 42 inch Saw, 1400 lbs.

The 38 and 42 inch Machines are of the same design and construction. The saw is fitted to a large flange that centers the saw perfectly and keeps it in balance, this machine can be furnished with the common or the Maud S. Carriage. Maud S. Carriage weighs but 12 lbs., all metal and about half the weight of any carriage made. It requires but one screw to change a but or point, either changed without altering the other.

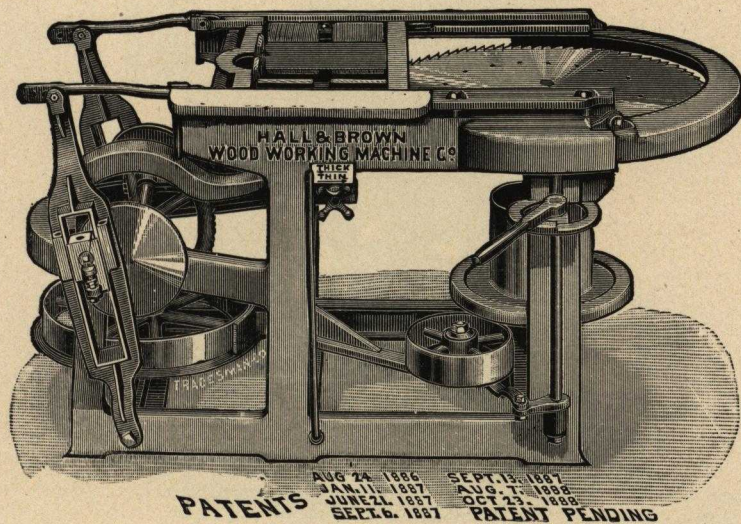
One screw regulates the thickness of the shingle and difference between the saws.

One screw changes the tilt of table with a positive automatic lock on the tilt screw, no check nut is required.

Positive throw to tilt handle, no possibility of its rebounding from its adjusting screw.

Extension ways on tilt table so that carriage is shoved no farther to cut a shingle when the saw is worn down small, than when full size.

The common carriage is the lightest with equal strength, weighing less than 27 lbs., being constructed entirely of wrought iron, brass and forged steel. Shingles from 16 to 19 inches long can be cut on the 38-inch Machine. Shingles from 16 to 26 inches long can be cut on the 42-inch Machine. Pulley on the Mandrel of the 38-inch Machine is 12 inches in diameter and 8 inch face and should make 1800 revolutions per minute. Pulley on the Mandrel of the 42-inch Machine is 14 inches in diameter and 10 inch face and should make 1600 revolutions per minute. The 38-inch Machine should be driven by a 43x8 Pulley on line shaft making 500 revolutions per minute. The 42-inch Machine should be 41x10 inch Pulley on line shaft making 500 revolutions per minute.



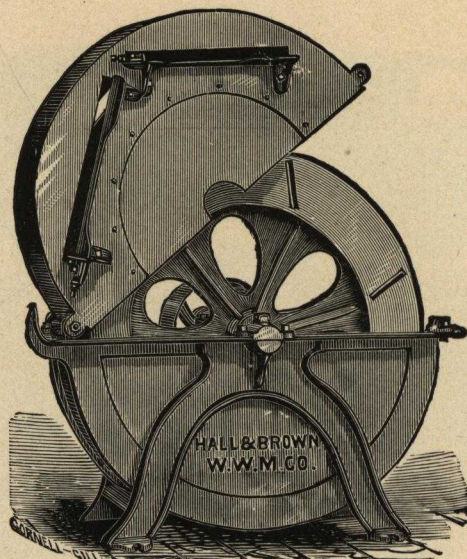
PERFECTION POWER FEED SHINGLE MACHINE.

Weight, 2,500 lbs.

Simplicity of adjustment and safety in its operation, correctly describes the above Power feed Shingle Machine.

This Machine is made in three sizes, viz: for 38, 40 and 42 inch Saws. The 38 inch Machine will cut shingles from 16 to 18 inches long.

The 40 inch Machine cuts from 16 to 20 inches long, the 42 inch Machine cuts from 16 to 24 inches long, each size Machine cuts $14\frac{1}{2}$ inches wide. Pulley on the Mandrel of the 38 inch Machine is 12 inches in diameter 8 inch face and should make 1800 revolutions per minute. Pulley on Mandrel of 42 inch Machine is 14 inches in diameter and 10 inch face and should make 1600 revolutions per minute. The 38 inch Machine should be driven by a 43x8 inch Pulley on line shaft making 500 revolutions per minute. The 42 inch Machine should be driven by 41x10 inch Pulley on line shaft making 500 revolutions per minute.

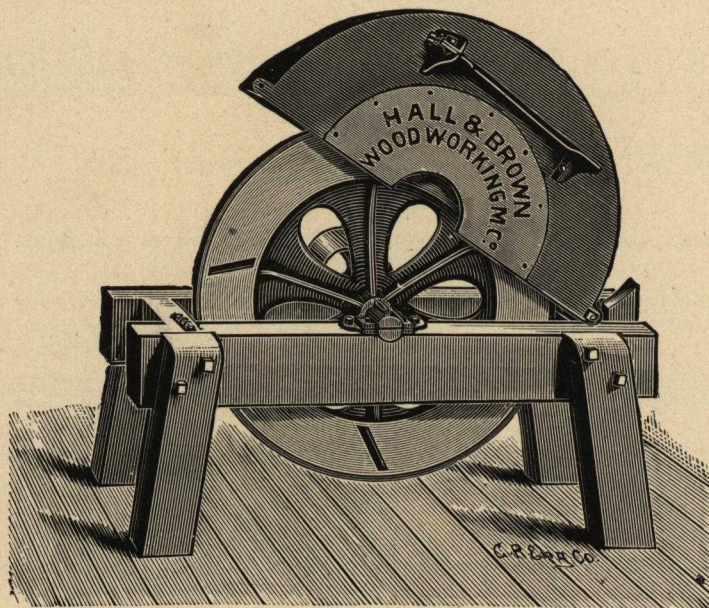


40 INCH SIX KNIFE SHINGLE JOINTER.

Weight, 710 lbs.

This iron frame Jointer has a double shingle rest, adjustable shingle gauge, reversible shield and planed bearing for the Knives.

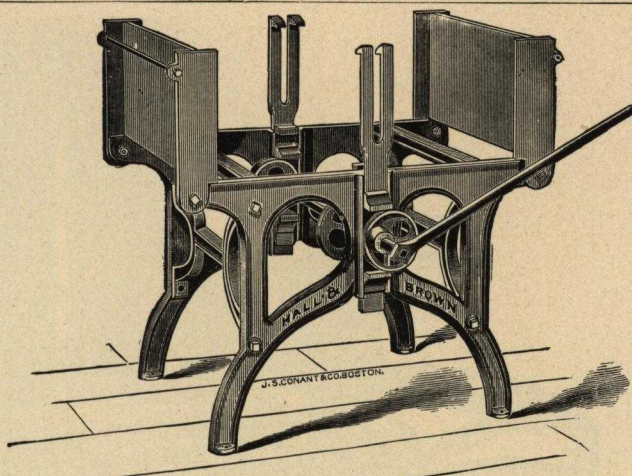
Pulley on the wheel shaft is 12 inches in diameter and 6 inch face and should make 900 revolutions per minute.



40 INCH WOOD FRAME SHINGLE JOINTER.

Single Rest, Weight, 480 lbs.

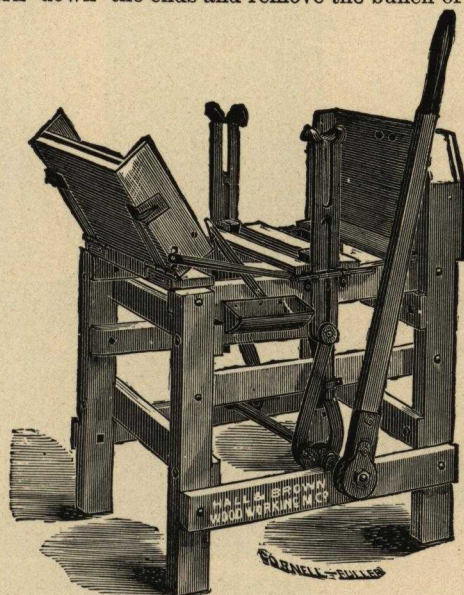
Runs from right to left, Direction of motion does not influence spouting for shavings. Pulley on wheel shaft 12 inches in diameter 6 inch face and should make 900 revolutions per minute.



SHINGLE PACKING BOX.

Weight, 200 lbs.

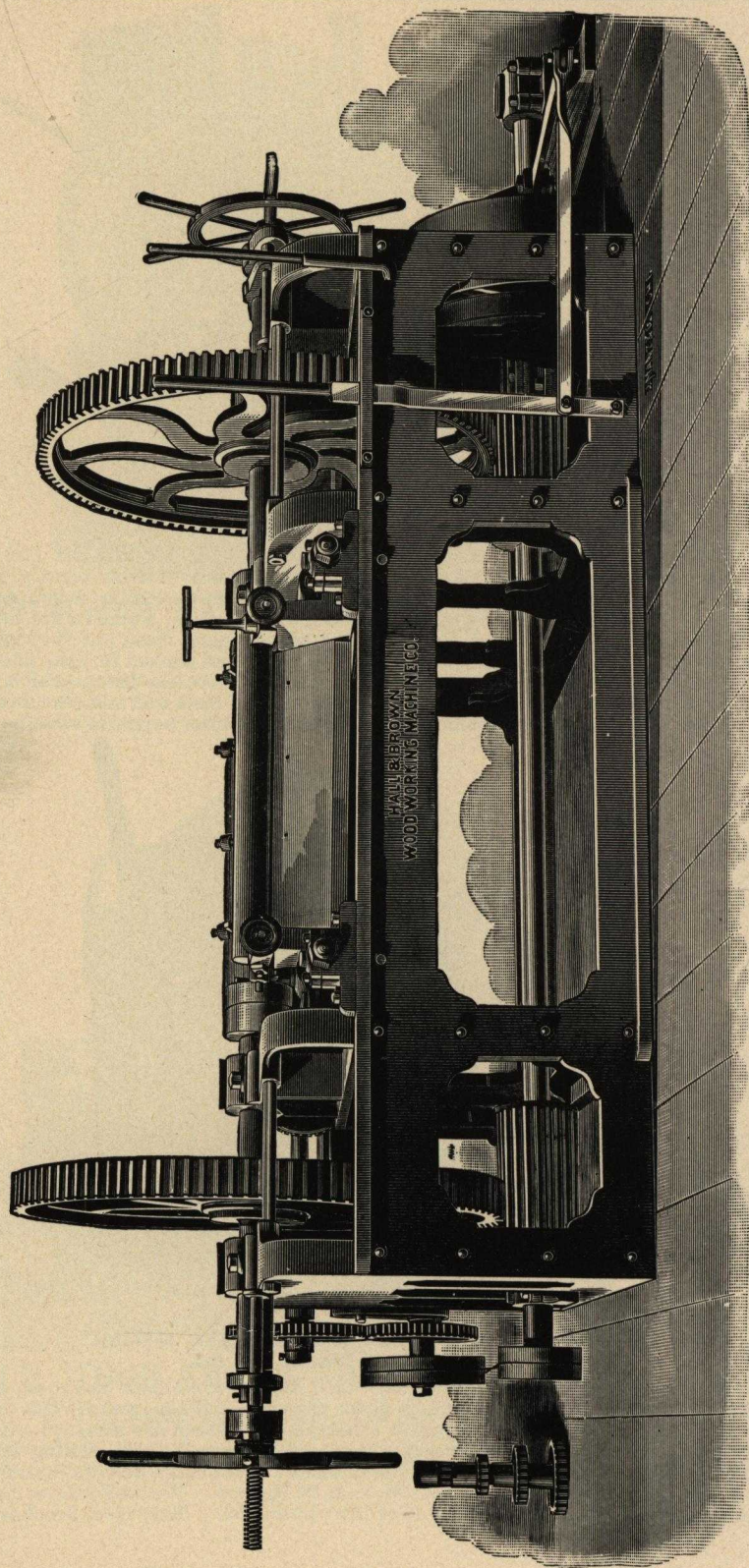
The above cut illustrates a Buncher we have been building the last ten years for the convenient packing or bunching of shingle. The frame is of iron, occupying a floor space of 35 inches by 30 inches, and stands 33 inches high. Its operation is simple; the end pieces and the lever operating the cams having been raised, place a slat in the lower jaws, to each end of which has been fastened the iron binders and bend them out through the slots in the upper jaws. The required number of shingle having been packed in, (the points to the centre), place the top slat under the upper jaws and bear down on the lever, which presses the upper and under jaws together; when in that position bend back and nail the binder to the upper slat, release the lever, turn down the ends and remove the bunch of shingle.



SHINGLE PACKING BOX.

Wood Frame, 167 lbs.

It is made over a true form of the exact size of the bunch required, and is of the best material and workmanship. Turning down the end-board to remove the bunch, spreads the jaws apart, so that neither the packer's temper nor bunch are strained out of square. The end-board has two heavy iron clasps to prevent sides from spreading when crowding in shingles. Back leg reaches to the top of Packer. Cast iron box for hammer and nails. 20 inch, 25 courses; 22 inch, 22½ courses; 25 inch, 20 courses. We make these machines 20, 22 and 25 inches wide. It is adjustable for 16 or 18 inch shingles. Size, 2 feet 8 inches by 2 feet 6 inches.



THE "BLAKESLEE" ROTARY VENEER MACHINE.

The "Blakeslee" Rotary Veneer Machine.

For cutting all kinds of veneers for fruit packages, egg cases, cracker boxes, baskets, barrels, etc.

In calling your attention to our Veneer Cutting Machines we desire to say: Our first aim has been to manufacture a machine that is practical and one that will do satisfactory work, producing veneers that are solid and free from shakes even when cutting the maximum thickness.

We have found it necessary to make a much heavier machine than some of our competitors (as a comparison of weights will show), experience having demonstrated the unsatisfactory work of the lighter machine.

Our method of making the frame in sections, and bolting together with turned bolts not only makes it convenient for shipping, but enables us to place the material in a position to withstand the greatest strain, the resistance being in straight lines through the sides of frame.

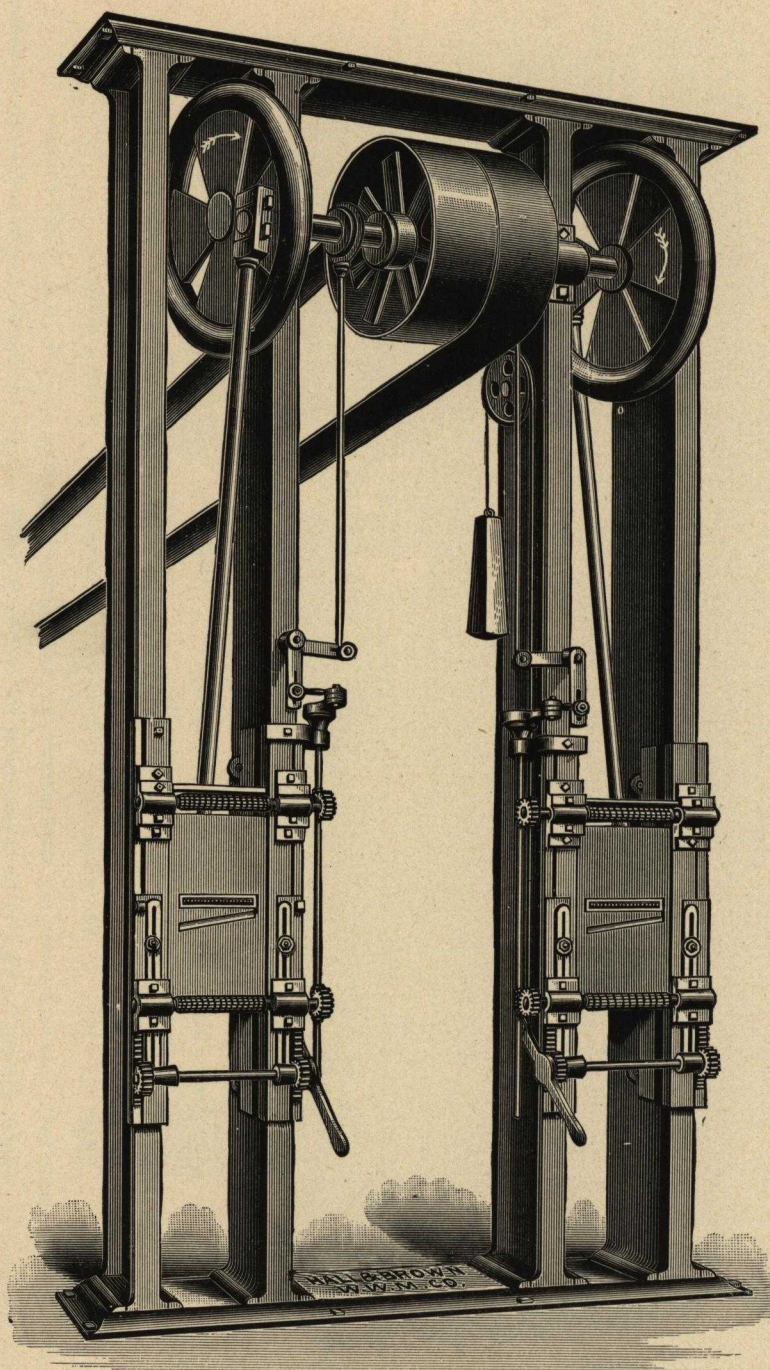
This mode of construction also enables us to use back rollers for cutting to width and irregular shapes, producing length, width and thickness at one operation from the log, which gives the capacity of several combined machines at a cost of operating one.

No.	Cuts a log,	Length.	Diameter.	Weight.	Floor Space.
1.	Cuts a log,	26½ inches,	40 inches,	10000 lbs.	7 feet x 10 feet.
2.	Cuts a log,	32 inches,	48 inches,	12000 lbs.	8 feet x 11 feet.
3.	Cuts a log,	48 inches,	48 inches,	15000 lbs.	8 feet x 12 feet.
4.	Cuts a log,	54 inches,	48 inches,	16000 lbs.	8 feet x 14 feet.
5.	Cuts a log,	60 inches,	48 inches,	17000 lbs.	8 feet x 15 feet.
6.	Cuts a log,	72 inches,	48 inches,	20000 lbs.	8 feet x 16 feet.

This includes one main knife, one back roller, one steel pressure bar and gearing for cutting $\frac{1}{32}$, $\frac{1}{16}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{5}{16}$ and $\frac{3}{4}$ inches.

If the Machines are wanted without the back roller arrangement for cutting to width (simply cutting the length and thickness) deduct 10 per cent.

Driving Pulley is a friction, 30 inches in diameter, 10 inch face, and should make 100 revolutions per minute on the No. 1 Machine, 150 on the No. 2, and 450 on all other sizes.

**EXCELSIOR CUTTING MACHINE.**

Weight, 3700 lbs.

Excelsior Cutting Machine.

Excelsior Wood Shavings is a staple article. Thousands of tons are made and sold daily, and the various uses it is put to are constantly increasing. It is used by Upholsterers, Mattress, Furniture and Carriage Makers and Undertakers. It is also used for packing all kinds of Queensware, Glass, Toys, Confectioners and Druggists Goods, Hardware and other articles too numerous to mention.

It is much preferred to straw, hay and other substances, as it is clean, odorless, elastic and easily handled. It is delivered in bales, occupies little space, and is handy for use.

Standard Excelsior is 18 inches long, 1-100 inch thick, and is divided into three grades, according to the width, as follows: Fine, which is 1-26 inch wide; Medium, $\frac{1}{8}$ inch wide, and Course, 7-32 inch wide. For common uses, such as packing, Excelsior is often cut thicker.

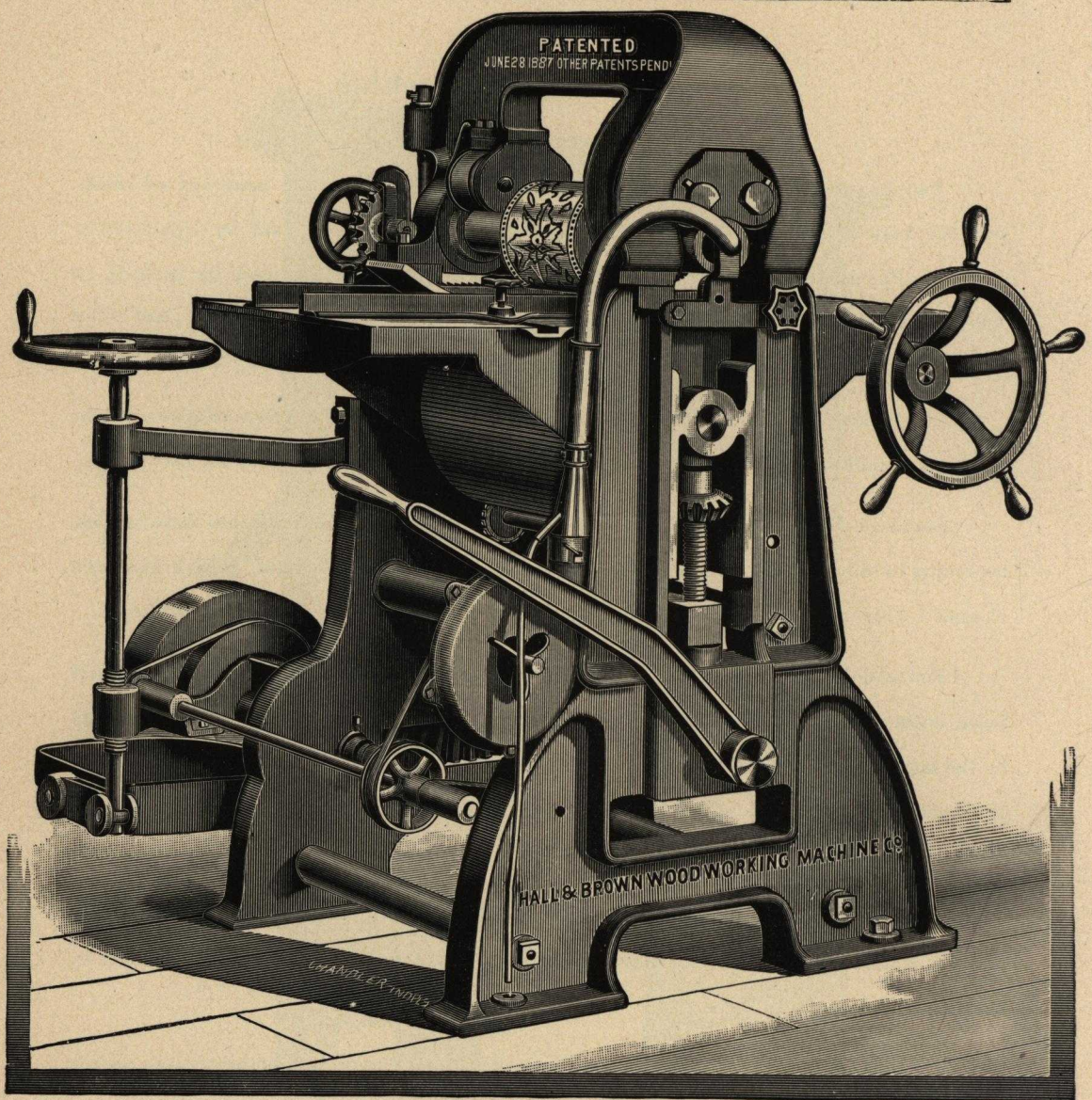
For manufacturing this article, we now offer a machine to the public, and guarantee it to be, without exception, the simplest, most durable and economical Excelsior Cutting Machine in the market. This machine is made double, same as two single machines run by one belt. It requires less room and power than any other make, and will turn out more and better Excelsior in a given time.

The entire machine is made of Iron, Steel and Gun Metal, which is far superior to the common wood frame, as it will not warp, shrink or lose its shape from hard wear or changes in the temperature.

The four iron columns are faced on the ends to fit square on top and bottom plates, which are planed off, and firmly bolted to same. The balance wheels are extra heavy and balanced, to give a steady motion, and are keyed to top shaft.

The slides on the machine are made separate from the machine, and are securely fastened to it. We make them separate, so if any piece of it is broken, it can be replaced at a small cost by a duplicate, without taking machine apart, which otherwise would need be done.

The Tight and Loose Pulleys are 24 inches in diameter and 8 inch face and should make 200 to 250 revolutions per minute.



EMBOSSING MACHINE.

Weight, 16 Inches Wide, 1800 Lbs. Weight, 19 Inches Wide, 2000 Lbs.

The above cut represents our Wood Embossing Machine for ornamenting wood of all kinds for House Interior, Cars, Furniture, Bedsteads, Tables, Lounges, Chairs, Embossing either, or both sides of bent stock for Chair Backs, Arm Rests, Desks, Brackets, Casings, Panels, Mouldings, Corner Blocks, Rosettes, &c. The Machine is provided with adjustable Feed Rolls, and instantaneous Drop Table, thereby enabling the operator to place with accuracy the ornament at any desired point on the stock. It will accommodate stock from $\frac{1}{4}$ to 5 inches in thickness and from $\frac{1}{4}$ to 16 or 19 inches in width. It is capable of producing from 18 inches to 3 feet of product per minute (lineal measure), and of the highest order of ornamentation, superior in beauty and effect to hand carving, coupled with a finish obtained by no other process. The method by which these results are achieved are of the most simple and natural character, requiring neither skilled labor nor any special treatment of lumber, which can be used either yard, or kiln dried. This Machine is strong in build, modern in construction, possessing great durability, producing a maximum amount of work in a given time, of high order, good quality, varied character and at a minimum cost.

Continued on next page.

EMBOSSING MACHINE.

The Machine is heated with either gas or gasoline with convenience and absolute safety. In ordering Machine it is necessary to state which method of heating will be used.

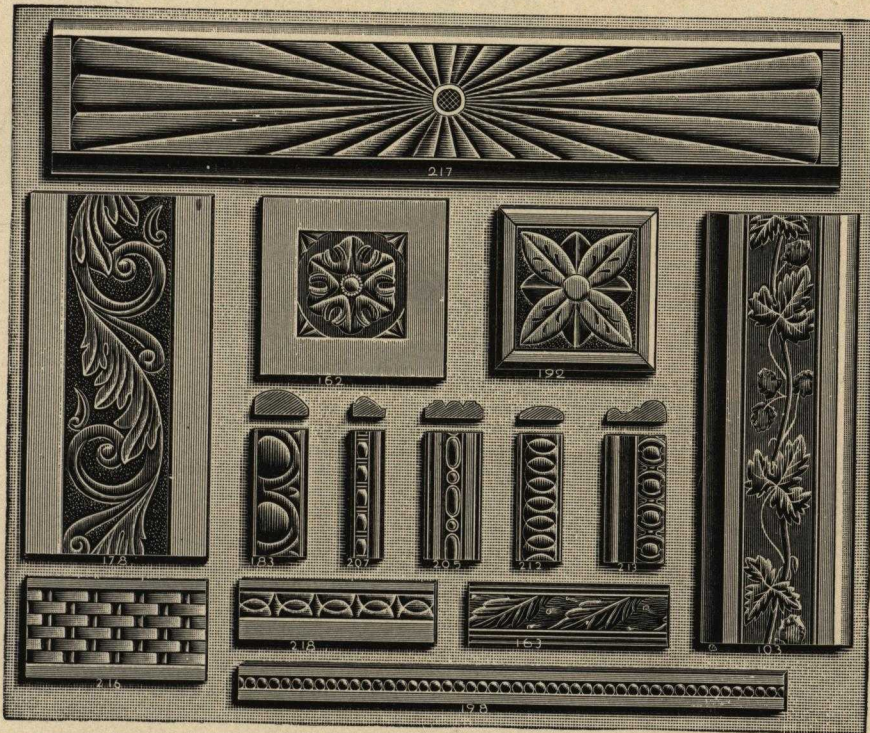
We also attach when required, at an extra cost, a Double Reversible Friction Feed Pulley. This attachment enables the operator to cause the stock to pass back and forth under the die as often as he pleases, thereby making deeper impressions and the more refractory woods are easily managed.

No Manufacturer of Cars, Furniture, Chairs, or Interior House finish can afford to be without one of these Machines, who in view of the strong competition in these various branches desire to avail themselves of every advantage to lessen the cost of their product.

The Machine is driven by 2 Pulleys, 16 inches in diameter, and 3 inches face and should make 80 revolutions per minute. Belts in length to suit from line shaft.

Write for detailed description, price and samples of work.

SAMPLES OF WORK DONE ON EMBOSSING MACHINE.

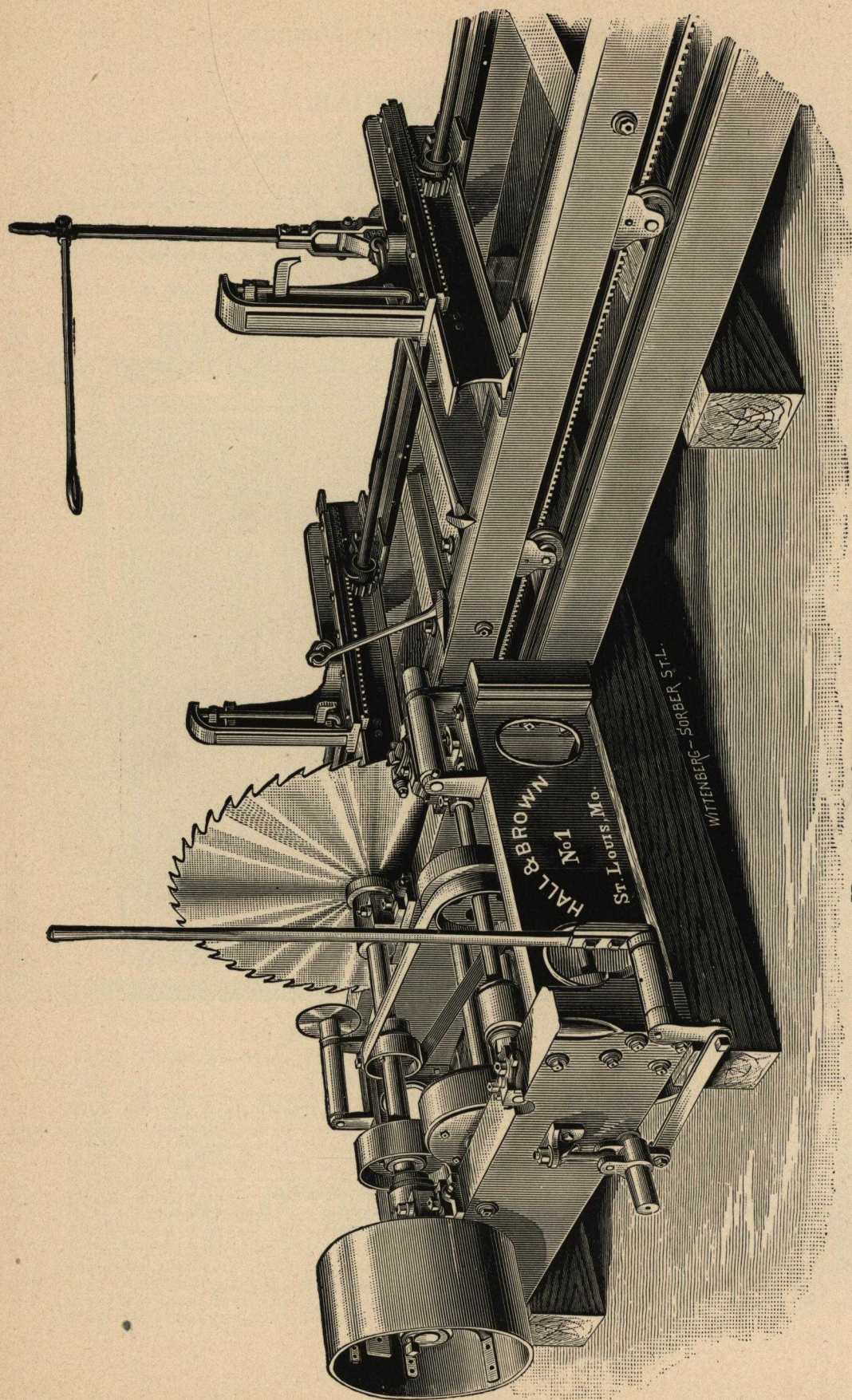


Above Cut shows a portion of the highest and lowest priced Dies we carry in stock.

NET PRICE LIST OF DIES SHOWN IN ABOVE CUT.

No.	SIZE.	PRICE.	No.	SIZE.	PRICE.
103.	2 3/8 inch	\$10.00	198.	3/4 inch	8.00
163.	1 1/2 "	12.50	205.	3/8 "	25.00
178.	3 3/8 "	\$9.00 to 15.00	205.	1 "	27.00
183.	1 1/2 "	17.00	207.	1/2 "	10.00
183.	3/4 "	18.00	212.	1 1/4 "	23.00
183.	3/8 "	18.00	213.	3/4 "	25.00
183.	1 "	20.00	216.	2 1/4 "	16.00
183.	1 1/4 "	25.00	217.	3 1/2 x 2 1/2 inches	30.00
192.	4x4 inches, 2 on a die	14.00	162.	3 1/2 x 3 1/4 " 2 on a die	12.00
198.	1 1/4 inch	6.00	220.	1 1/4 inch	18.00
198.	3/8 "	6.50	218.	1 1/4 "	15.00
198.	1/2 "	\$7.00			

Dies made to order from designs furnished at reasonable prices.



No. 1. PONY SAW MILL.

Weight, 2,300 lbs.

No. 1 OR PONY SAW MILL.

We claim our Pony Saw Mill to be the best light running Saw Mill in the market for engines from 8 to 15 horse power, and can be used with engines as large as 20 horse power, as far as the strength of the Mill is concerned. We aim to produce in this Mill, one that is simple and strong in construction, will run easily and turn out the greatest quantity of correct sized lumber with proper attention, and still be reasonable in price. We have sold large numbers of these Mills throughout the Mississippi Valley, and have yet our first complaint to receive against them. To saw correct lumber is one-half of the success of a Mill, as good lumber will always find a market and bring the best prices. With our smallest Head-Blocks, we give the same care and attention as with the largest, and they are as accurate in setting, a point every buyer should consider.

Husk Frame is 7 ft. 6 in. long by 3 ft. 8 in. wide, 12 in. deep, made of the best Yellow Pine, and has cast iron ends fitted and bolted to timbers.

The Saw Mandrel is 5 feet long, turned from 2½ inch steel bar, and runs in two of our Patent Self-Oiling Journal Boxes, Bearings 8 inches long. The bottoms of Boxes are planed and rest on planed plates, which have lugs holding set screws to adjust Boxes lengthways of Mill. One special advantage of these Boxes is that the Mandrel will run from one to three days with one filling of the Oil Cellar or Reservoir under the Journal.

The Drive Pulley, unless otherwise ordered, is 20 inches diameter by 10 inches face, and balanced.

The Iron Friction on Mandrel is 10 inches diameter, and Iron Friction on Rag Shaft is 20 inches diameter, both 4½ inch face and Webb Centres, and keyed to shafts.

The Feed Paper Friction is 4 inches diameter, and the Gig Paper Friction is 14½ inches diameter, 4½ inch face, both made of the best Tar Board Paper, not cheap straw board paper used by most manufacturers.

The Cones are for 2 inch Feed Belt, giving a feed of 1 and 2 inches, and the Backing Speed is 6 inches.

The Splitters and Rollers are turned and bored, and turn on steel shafts.

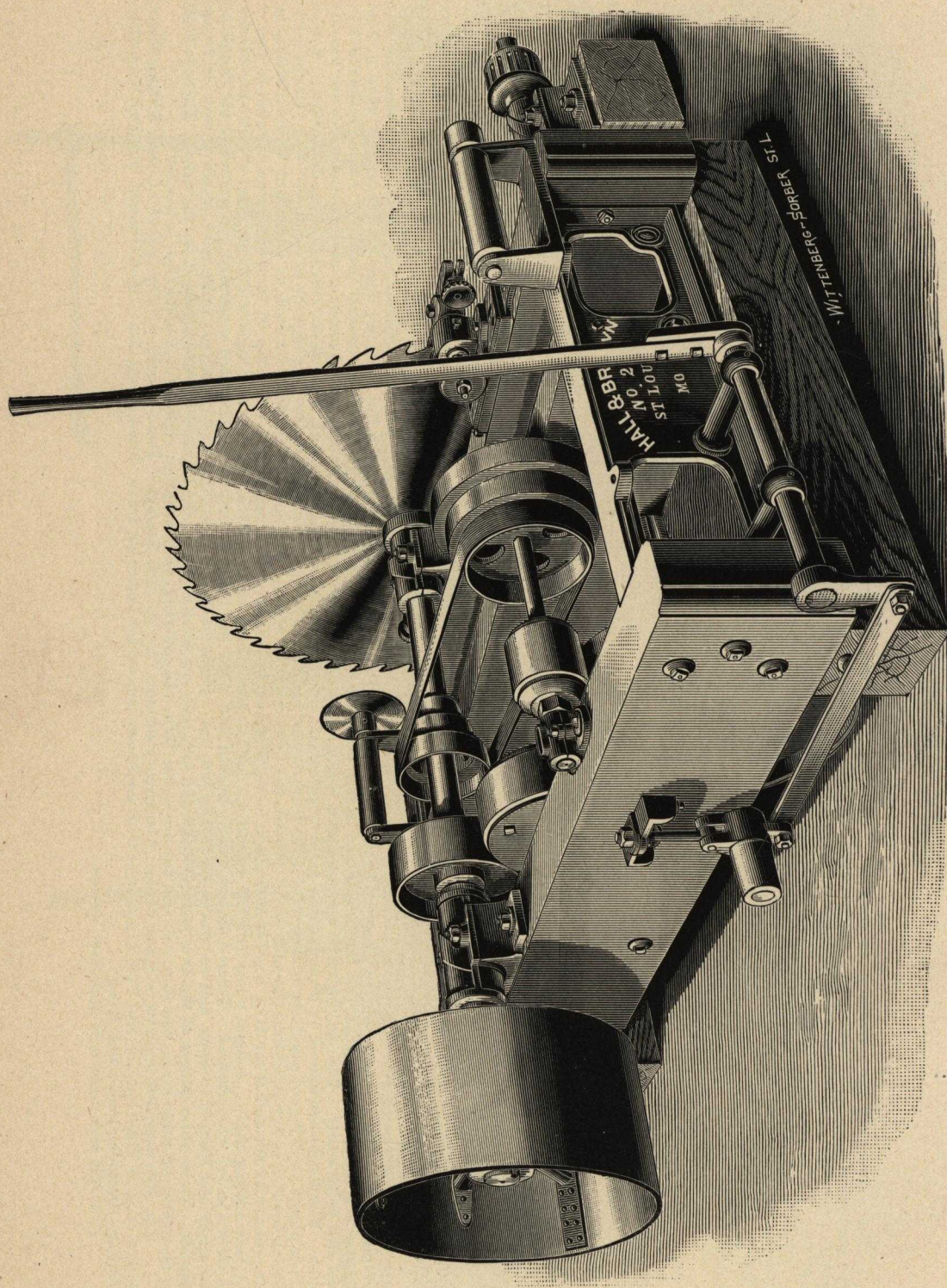
The Rag Shaft is made of 1½ inch steel, and has the end on which the Iron Friction is fitted, resting in a swinging Box which can be adjusted to take up the wear of the Paper Frictions, an advantage over all other small Mills.

The Carriage Regular is 18 feet long, with 23 feet of Rack Stick, made of 6x6 timbers, mortised, tenoned, and firmly fitted together. For convenience in handling and to prevent warping, we make the Carriage in equal sections. The Rollers under Carriage, 6 grooved and 6 flat, are turned and bored and fitted on steel shaft, which rest in cast iron chairs.

The Bodies of our Blocks are made of steel I beams instead of cast iron, and are warranted not to break, especially at the ends by logs turning over and falling on them, as is so often the case when cast iron is used. The Knees are made sufficiently strong to avoid breaking and are planed to fit beams and held in place by gibs. When Patent Dogs are not used, we place the ordinary dogs on knees, and have a Steel Sliding Dog for the last plank. The Ratchet Wheel, Racks and Pinions are cut from solid metal and fit together perfectly, having no lost motion and still work easily. This can never be said of racks and gear wheels where the teeth are cast in the sand, as no two cast racks are exactly alike. The Knees are moved by lever holding pawl working on ratchet wheel, placed alongside of an arch on which a scale is marked. A steel pin is placed in different positions in arch to suit the thickness of lumber to be cut. The timber is set by eighthths of an inch. When desired, the setting lever is so arranged that the sawyer can reverse the motion of the Knees, and have them move forward or backward without changing his position at the end of the Mill, a great advantage in Mills of average capacity, at small cost. With the 36 inch blocks we furnish 18 feet of 1½ inch setting shaft. A hand wheel is fitted on setting shaft to run Knees rapidly back together. Knight's Patent Dogs are fitted to blocks, as shown in cut when desired. These dogs are widely known and need but little description. They are generally recognized as the Simplest, Strongest and Easiest to work, and are the cheapest Dogs in use. It can be handled quickly, and is positive in its hold, either in wet or frozen lumber. There is no danger of the Dog jarring loose, and will only release its hold on the log through the hands of the operator. There is little or no repairs on these Dogs, and they will last the life of the Mill. In ordering, state whether right or left hand Dog is wanted.

The Mill complete consists of Husk Frame, 2 sections Carriage, two 36 inch Standard Head Blocks with 18 feet of 1½ inch Setting Shaft, 42 feet each of Wrought Tee and Flat Track Iron with necessary screws for fastening track down, Feed Belt, Mandrel and Monkey Wrenches, Oil Can, Swage and one Cant Hook.

This Mill will carry a 56 inch Saw, or less.



No. 2. SAW MILL, SINGLE OR DOUBLE.

Weight of Single, Mill 4250 lbs.

Double Mill, 5100 lbs.

No. 2. Saw Mill Single or Double.

This Mill is the most popular size judging from the large number sold. It is intended for driving powers ranging from 15 to 35 horse power, and will carry saws 60 and 30 inches diameter and less. The capacity is from 8,000 to 15,000 feet per day.

The Husk Frame is 8 feet long by 4 feet 3 inches wide, made of 12x6 inch yellow pine, fitted with heavy cast iron ends.

The Mandrel is 6 feet long, turned from 3 inch steel bar, and runs in our Patent Self Oiling Journal Boxes, with bearings 10 inches long. The Driving Pulley usually furnished is 24 inches in diameter, 13 inch face, and balanced. The Feed Cones have three steps for 2½ inch belt, and give feed of 1½, 2 and 2½ inches. The backing speed is 6 inches.

The Iron Friction on Mandrel is 13 inches diameter, and the Iron Friction on Rag Shaft is 23 inches diameter by 5 inch face, both having web centres. The Gig Paper Friction is 14½ inches diameter, and the Feed Paper Friction is 5½ inches diameter, both 5 inch face, made of Tar-Board Paper.

The Rag Shaft is Steel, 1½ diameter, with outer bearing under carriage running in Self Oiling Journal. The end of Rag Shaft holding Iron Friction, swings in a bearing outside of Husk. (See cut). This is done for convenience in adjusting and handling. The swinging motion is obtained by a wrought iron lever fastened to shaft in front of Mill, shaft being connected with swinging box by wrought iron link. The lever can be slipped sideways towards saw for the convenience of the sawyer who desire to sight the lumber.

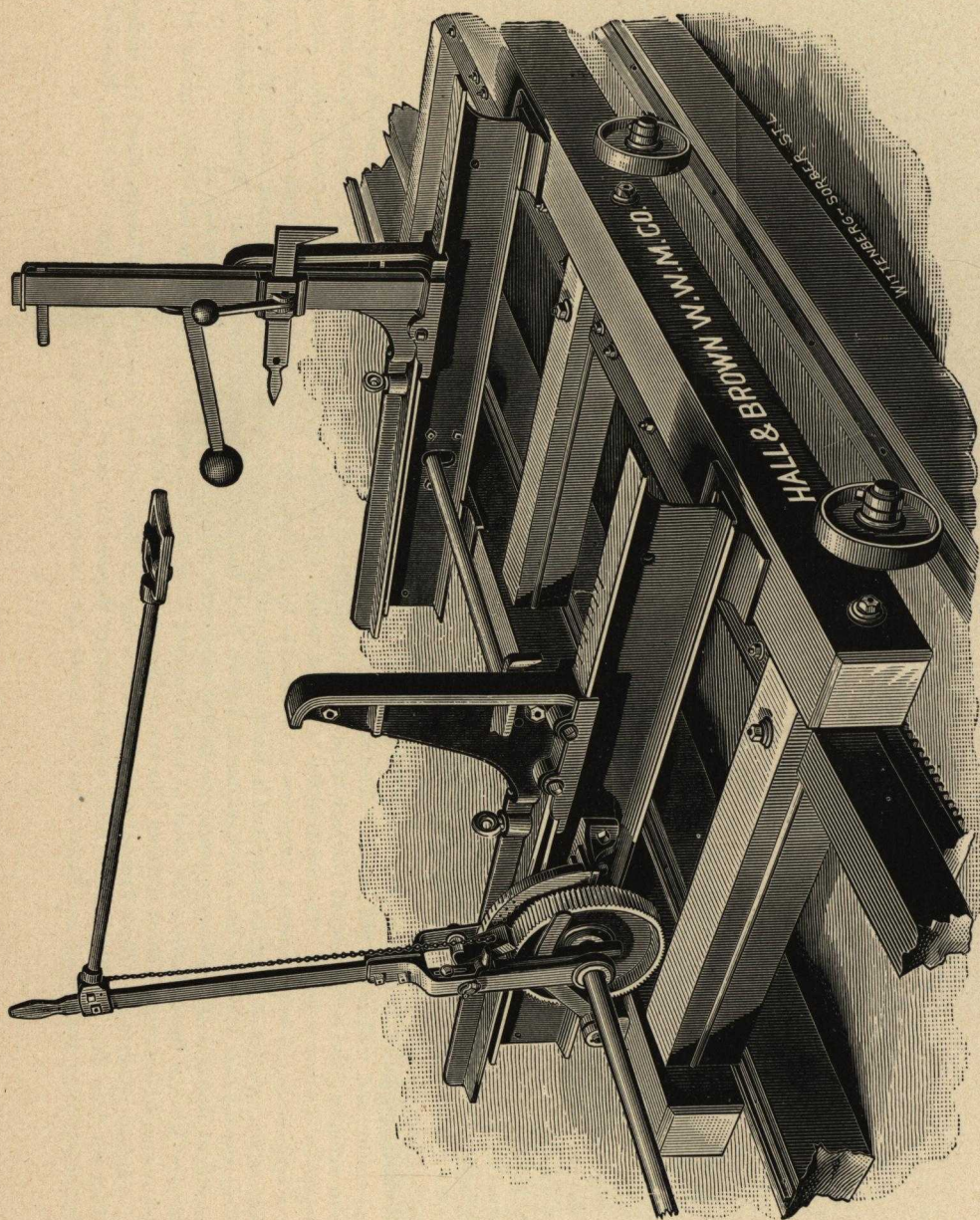
We use our Patent Improved Saw Guide on these Mills, as shown in cut (large cut and full description will be sent on application.)

The Carriage is 24 feet long, made in equal sections, of 6½x6½ inch timber, and has Rack Stick 30 feet long, of 6x4 inch timber. This makes an unusual strong Carriage. The Carriage is run on twelve 8 inch wheels, 6 grooved and 6 flat, fitted on 1½ inch turned steel axles, which run in Self-Oiling Babbitted Boxes. The axles are so arranged that the Carriage can be moved to or from saw without moving the track.

Special Attention is called to the Top Rig (large cut of same will be sent on application), which is of new design, very attractive, made extra heavy and strong, and will weigh 860 pounds. The uprights are held in rigid position by three wide braces which are firmly secured to uprights by bolts extending the entire length through them. The top Mandrel Frame has three bearings for mandrel to prevent vibration of saw, and is assisted by a top saw guide. The top Mandrel is turned from a 2 inch steel bar, and is driven by a 7 inch belt. Attention is called to our manner of tightening top belt (shown in large cut of the double Mill); the Lever is connected with Tightener Pulley by a wrought Iron Fork, and is held in any position it is set to by a Pawl in Rack. This will prevent a jumping motion so common among other styles of top belt tighteners. When the top saw is not in use, the tightener is thrown back and held off belt by pawl in notch. Another feature is, that the top rig is all on one side of Mandrel, thus allowing nearly one-half of the length of the Mandrel for the board to fall on.

With this size Mill we furnish either the 40 or 44 inch Standard Head-Blocks, with the gears to the set works cut out of the solid iron (fully described on special descriptive sheet of Head-Blocks), as the purchaser may desire.

The Mill complete consists of: Husk Frame; 2 Sections of Carriage; 2 Head-Blocks, with 24 feet of Setting Shaft 1½ inches diameter, 60 feet each of Wrought Iron Tee and Flat Track Iron, with necessary Screws for same; Feed Belt; Swage; Oil Can; Mandrel and Monkey Wrenches; Tightener Pulley, with Shaft and Boxes; two Cant Hooks, and Improved Saw Guide.



STANDARD RACK AND PINION HEAD BLOCKS,

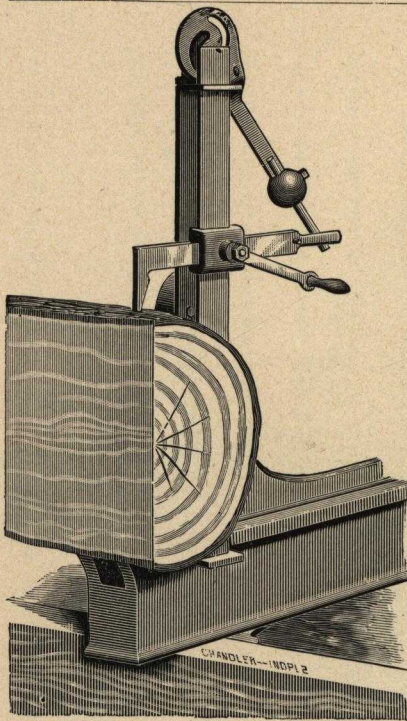
Opening 36, 40, or 44 inches.

Standard Rack and Pinion Head Blocks.

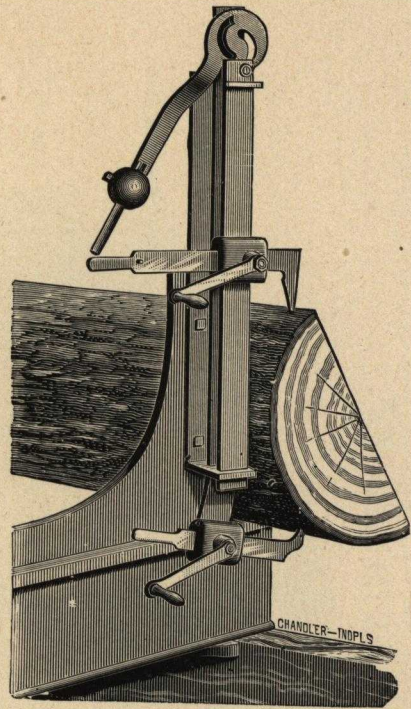
One of the special features we claim for our Mills is the superiority of our Head-Blocks over those of most makers. The claims are for simplicity, strength, accuracy of setting, and the reasonable prices they are sold at. Every saw man knows the value of correct setting head-block, and to saw good lumber it is absolutely necessary to have them.

The bodies of our blocks are made of steel I beams instead of cast iron, and are warranted not to break, especially at the ends by logs turning over and falling on them, as is so often the case when cast iron is used. The knees are made sufficiently strong to avoid breaking, and are planed to fit beams and held in place by gibs. When patent dogs are not used, we place the ordinary dogs on knees, and have a steel sliding dog for the last plank. The ratchet wheel, racks and pinions are cut from solid metal and fit together perfectly, having no lost motion, and still work easily. This can never be said of racks and gear wheels where the teeth are cast in the sand, as no two cast racks are exactly alike. The knees are moved by lever holding pawl working on ratchet wheel, placed alongside of an arch on which a scale is marked. A steel pin is placed in different positions in arch to suit the thickness of lumber to be cut. The timber is set by eights of an inch. On the 40 and 44 inch blocks, the setting lever is so arranged that the sawyer can reverse the motion of the knees and have them move forward or backward without changing his position at the end of the mill, a great advantage in mills of average capacity. (See cut). With the 36 inch blocks we furnish 18 feet of $1\frac{1}{2}$ inch setting shaft, and with the 40 and 44 inch blocks we send 24 feet of $1\frac{1}{2}$ inch setting shaft. On the last two sizes of block we can send $1\frac{1}{2}$ inch shaft when desired at an extra cost.

A hand wheel is fitted on setting shaft to run knees rapidly back together. Knight Dogs are fitted to blocks, as shown in cut, when desired.



SINGLE.



DUPLEX.

BUCK SAW MILL DOGS.

To attach to any mill, drill two nine-sixteenth ($\frac{9}{16}$) holes in the standard or knee and bolt on the dog as shown in cut. The dog should set back from the face of the knee far enough to allow it to pass the bur or nut on the top saw when holding the last piece—or one inch on the carriage. The bottom of the dog should be two inches above the top of the head-block.

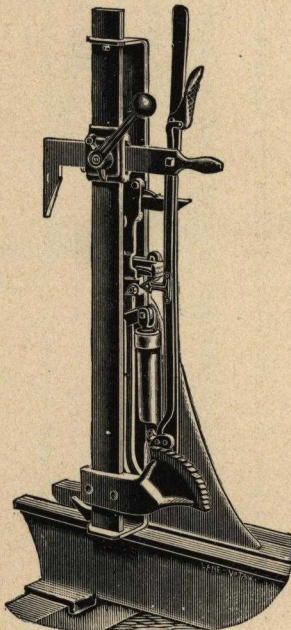
In ordering the Atkins Duplex Dog, give the exact dimension of knee to head-block; make a paper pattern of knee, full size, with impression of holes and thickness of knee four inches back from its face; also give the height and width of head-block.

KNIGHT'S NEW IDEAL SAW MILL DOGS.

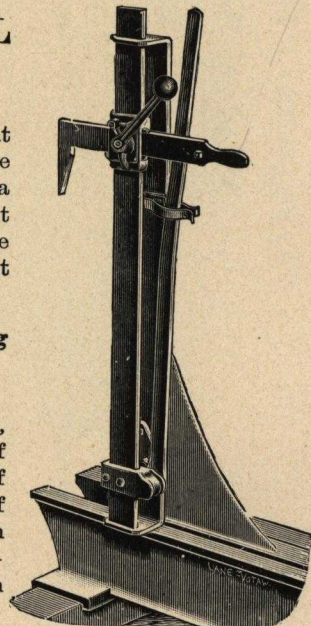
Right hand dog is used on the front head block and a left hand on the rear blocks. On a left hand mill a left hand dog is used on the front head block and a right hand on the rear. All dogs in cuts are right hand.

Directions for Fastening the Dog to the Head Block Knee.

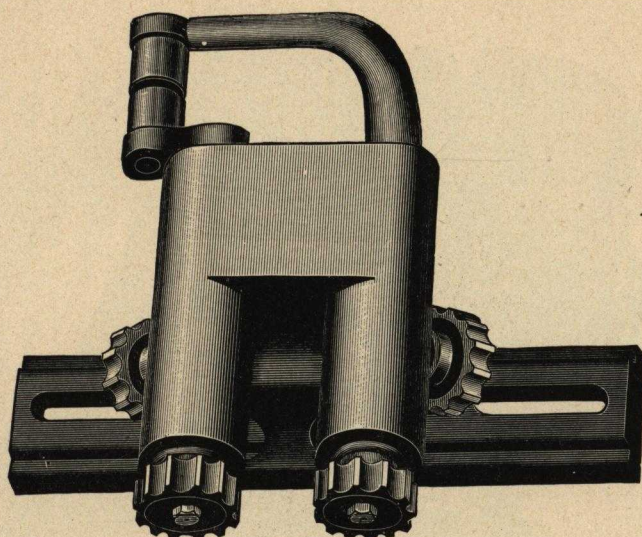
Bolt the dog to the side of the knee, as shown in cut, with the bottom of the main guide bar as near the top of the head block as the construction of the knee will permit, and far enough back that the lower dog will not project beyond the face of the knee when the lever is up in proper place.



SINGLE.



DUPLEX.

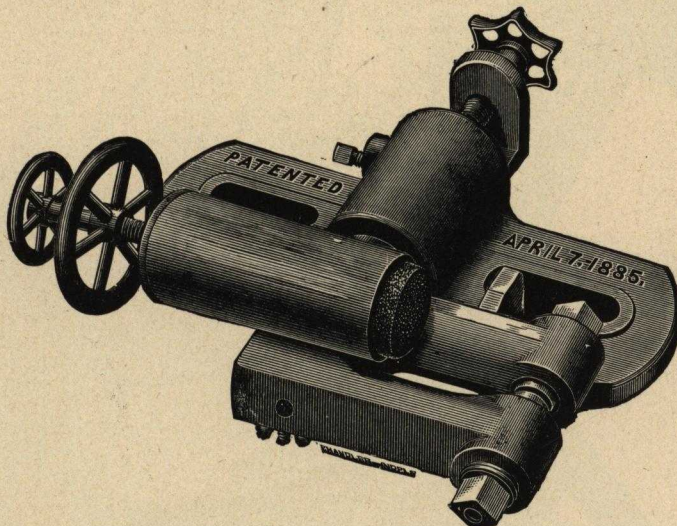


GUERNSEY'S PATENT SAW-GUIDE.

This guide is constructed in such a manner that the outside arm can instantly be turned up or back, so as to allow the removal of the saw from the arbor without the trouble of first removing the outside arm of the Guide from the standard, or changing the position of the Guide upon the frame.

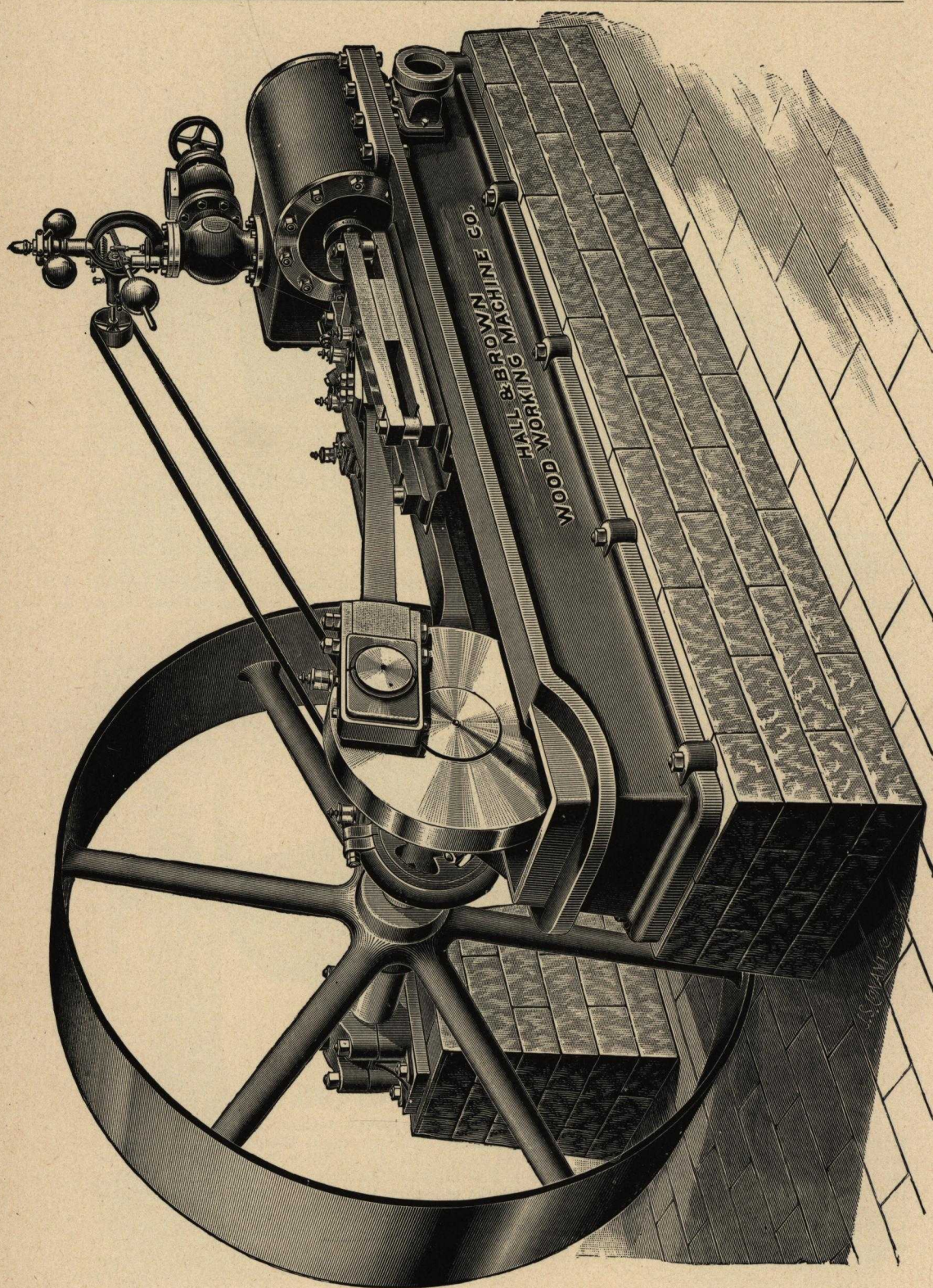
The stump or standard is cast in one piece, and the screws on each side of it can be turned against the arm, effectually preventing them from working loose and changing position when the mill is running.

The Guide can be instantly adjusted for saws of different diameters.



ATKIN'S PATENT SAW-GUIDE.

This Guide has many advantages which many others do not possess, it is adjustable and reversible. If the Guide pins are set a proper distance apart to admit the rotation of the saw, the adjustment is easily accomplished without danger to the operator, while the saw is in motion. Every sawyer will appreciate the practical value of this feature, as it is often necessary and desirable to change the lead of the saw without stopping the mill. The rounder attachment is novel and arranged for rounding or truing up, or jointing off the teeth so that each and every tooth will be the same length ready for dressing up thereby enabling each tooth to do its share of the work.



STATIONARY (SIDE-CRANK) ENGINES.

12, 15, 20, 25, 30, 35, 40, 50, 60, 80, 100 and 125 Horse Power.

STATIONARY (SIDE-CRANK) ENGINES.

The cut on opposite page illustrates our Stationary (Side Crank) Engines. These Engines have Steel Piston, Valve Rods and Wrist Pins. The Beds are well proportioned and sufficiently heavy for duty required. The Shafts are forged steel. The Slides and Cross-Heads are extra in length and width, furnishing large wearing surfaces. The Cylinders are set low on the beds and have hot air jackets, thereby decreasing condensation, special attention having been paid to the arrangement of the Steam Chest, Ports and Exhaust, so that the most perfect drainage is secured. The Heater is independent of the bed, and all pipes easily accessible.

The Engine complete includes Pump, Heater, Band Wheel, Governor with Belt, Throttle Valve, Sight Feed Lubricator, and all necessary Oil Cups, Cylinder and Air Cocks.

When ordering please state whether Right or Left hand Engine is preferred. The cut illustrates a Right hand Engine. Each Engine is carefully tested under steam before shipment.

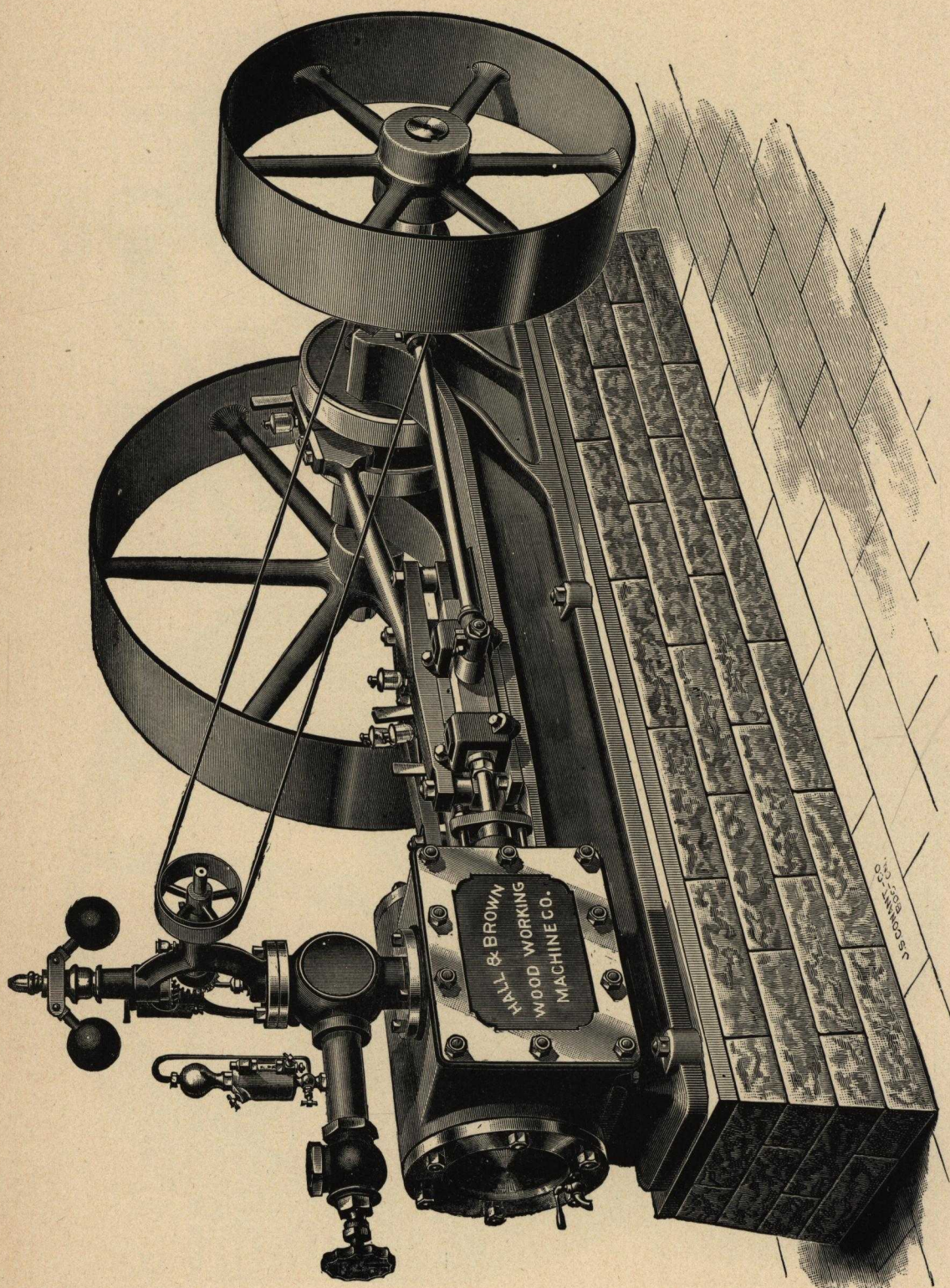
Any parts can be duplicated, special tools and templates being used in the construction of our Engines. Engines Nos. 12, 13 and 14 are not fitted with Pump and Heater.

SPECIFICATIONS OF STATIONARY SIDE CRANK ENGINES.

Number of Size	3	4	5	6	7	8	9	10	11	12	13	14
Horse Power	12	15	20	25	30	35	40	50	60	80	100	125
Usual Number of Revolutions	160	170	170	170	170	150	150	150	150	150	150	165
Diam Cylinder and length of Stroke	7x10	8x10	8x12	9x12	10x12	10x15	11x15	12x16	13x16	14x18	15x18	16x18
Diam of Band Wheel	48	48	54	60	60	72	72	84	84	84	84	96
Face of Band Wheel	12	12	12	14	14	14	14	16	16	16	16	18
Diam. of Shaft	2	2	3	3	3	4	4	4	4	4	4	6
Length of Shaft	4	4	4	4	5	5	5	6	6	6	6	6
Length of Journals	6	6	7	8	8	9	9	11	11	12	12	12
Diam. of Crank Pin	2	2	2	3	3	3	3	4	4	4	4	4
Diam. of Steam Pipe	1	2	2	2	2	2	3	3	3	4	4	4
Diam. of Exhaust Pipe	2	2	2	3	3	3	4	4	4	5	5	6
Diam. of Water Pipe	3	3	3	3	1	1	1	1	1	1	1	1

SIZES OF FLY WHEEL AND PULLEY.—Substituted in place of Balance Wheel when so ordered.

Diam. of Fly Wheel	60	62	72	72	84	84	84	96	96	96	96	96
Diam. of Pulley	36	36	40	40	44	44	44	44	48	48	48	48
Face of Pulley	10	12	12	12	12	12	14	16	16	16	16	18



DETACHED CENTER-CRANK ENGINES.

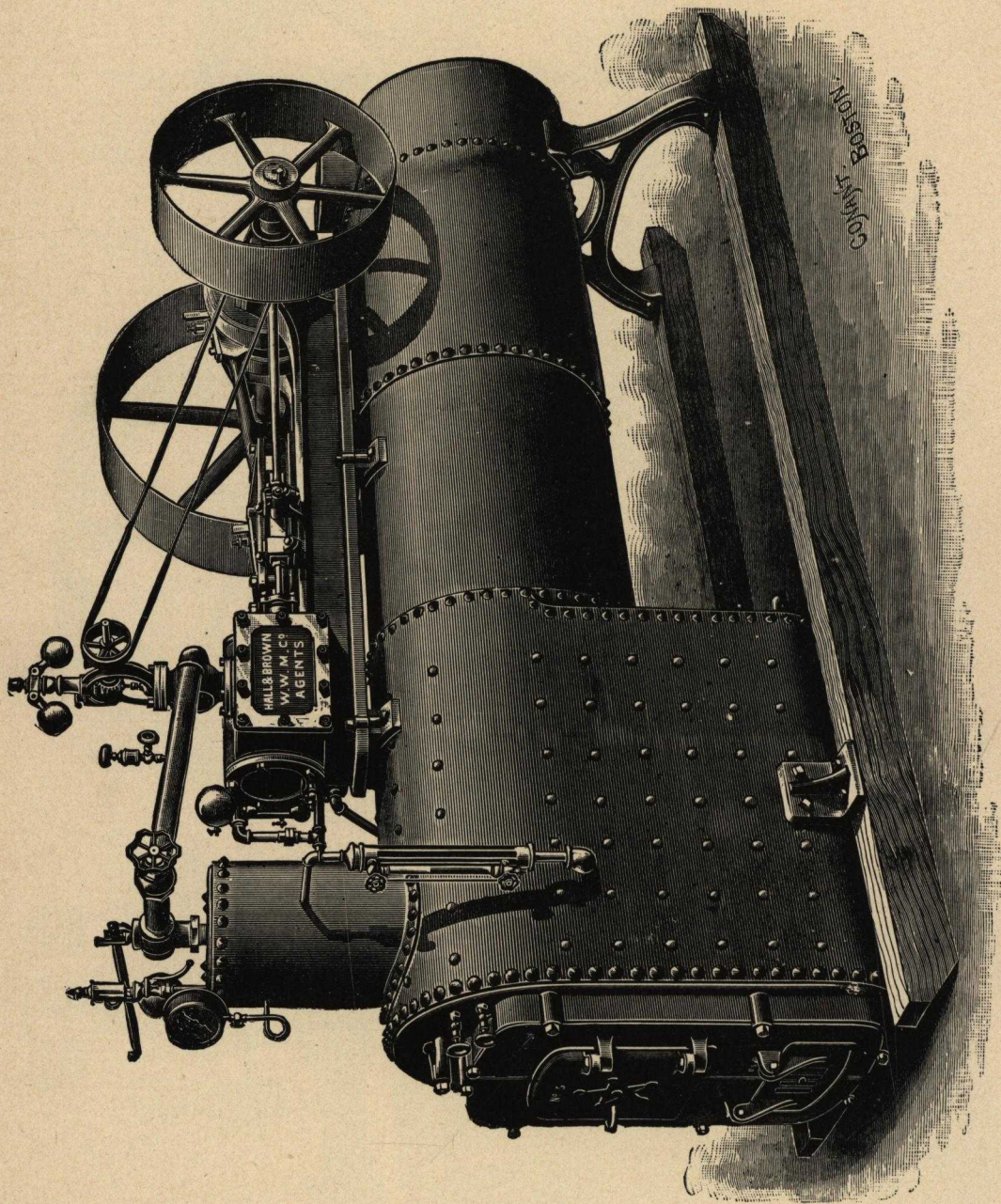
20, 25, 30, 35, 40, 50, 60, 80, 100 and 125 Horse Power. Engines Smaller than 20 H. P. have Cylinder overhanging Bed.

Detached (Center-Crank) Engines.

The cut on opposite page illustrates our Detached (Center Crank) Engine. This Engine is preferred in many localities to the Side-Crank Engine, as it is more easily set, requiring no extra foundation for out-end bearing. The Cylinders are set low, same as our Side-Crank Engines. The Cranks are solid forgings slotted out, having no welds, and the full Disc "Patent" Crank Balances perfectly balance the reciprocating parts. The Slides and Cross Heads are extra in length and width, furnishing large wearing surfaces. By the attachment of a reversing link the Engine is well adapted to hoisting purposes. The Engine complete includes Pump, Heater, Pulleys, Governor with Belt, Trottle Valve, Sight Feed Lubricator and all necessary Glass Oil Cups. Engines Numbers 12, 13, and 14 are not fitted with Pump and Heater.

SPECIFICATIONS OF DETACHED (CENTER-CRANK) ENGINES.

Number of Size.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
H. P. (as usually rated).	6	8	10	12	15	20	25	30	35	40	50	60	80	100	125
Diameter of Cylinder, in.	5	5	6	7	8	8	9	10	10	11	12	13	14	15	16
Length of Stroke.....	"	8	9	10	10	12	12	12	15	15	16	16	18	18	18
Usual No. of Rev.....	185	240	190	160	160	170	170	170	150	150	150	150	150	150	165
Diameter of Pulleys...in.	14&32	14&32	16&36	20&44	20&44	30&48	32&54	32&54	36&60	36&60	36&72	36&72	36&78	48&78	48&78
Face of Pulleys.....	8½&8½	8½&8½	8½&9½	10½&10½	10½&10½	8½&12½	10½&12½	10½&12½	10½&12½	10½&14½	12½&14½	12½&16½	12½&16½	12½&16½	12½&16½
Diameter of Shaft.....	2½	2½	2½	2½	2½	3	3½	3½	4½	4½	4½	4½	6½	6½	6½
Length of Shaft.....	37	37	41	51	51	52	57	57½	64	64	69	69	81	81	81
Length of Journals.....	5	5	5½	6	6	7	8	8	9	9	11	11	13	13	13
Dia. of Crank Pin.....	1½	1½	2½	2½	2½	2½	3½	3½	3½	3½	4½	4½	6	6	6
L'gh of Engine Bed.....	46	46	53	56	59	84	86	87	102	102	109	109	132	132	132
W'gh of Engine Bed.....	11	11	12	12	14	14	15	17	18	18	20	20	28	28	28
Dia. of Steam Pipe.....	1	1	1½	1½	2	2	2½	2½	2½	3	3½	3½	4	4½	4½
Dia. of Exhaust Pipe.....	1½	1½	2	2	2½	2½	3	3½	3½	4	4½	4½	5	6	6
Dia. of Water Pipe.....	¾	¾	¾	¾	¾	¾	1	1	1	1	1½	1½	1½	1½	1½

**PORTABLE ENGINES.**

6, 8, 10, 12, 15, 20, 25, 30, 35, 40 and 50 Horse Power. Engines smaller than 20 H. P. have Cylinders overhanging Bed.

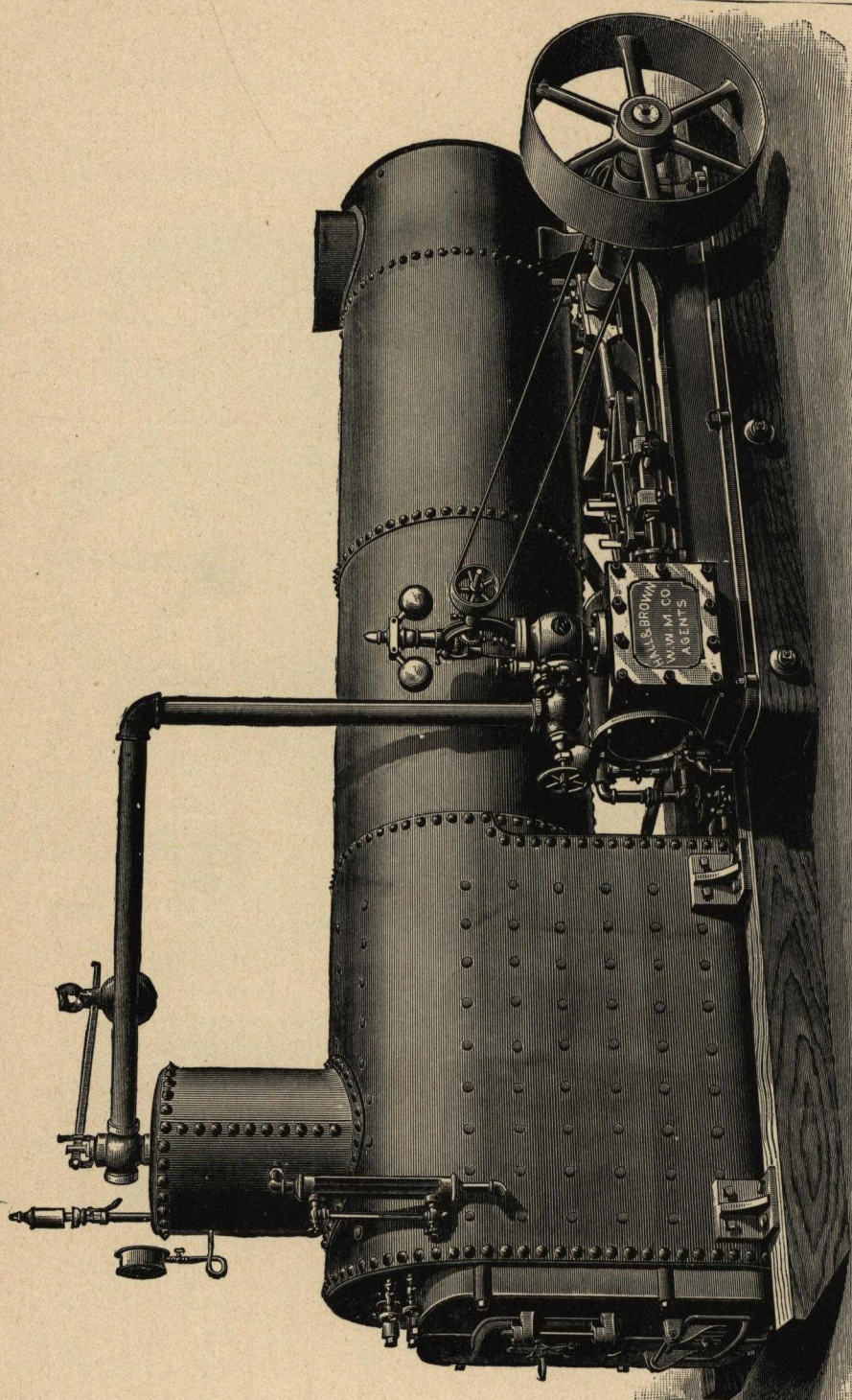
Portable Engines.

Cut on opposite page shows our Portable Engine, 6 to 50 Horse Power, inclusive. This style of Engine and Boiler combined is particularly adapted for Portable work, where no expensive or permanent foundation is required, the outfit being complete and ready for use when leaving our Works. The Engine may at any time be detached from Boiler by simply taking out the bolts holding it to the Iron Saddles on the Boiler, leaving no holes to plug and disconnecting the Steam Pipe. The sizes of Pulleys, as given in specifications, will be found suitable for nearly all kinds of work, but can be changed, if necessary, adding or deducting in price as the case may be. Nos. 9 and 10 have extra feet and additional leg for sufficient support. A cold water Section Pump driven by belt or hand will be furnished, if desired, but charged extra. Each Portable Engine is thoroughly tested under steam (after cold water test) before shipment.

These Engines complete, have the necessary Oil Cups, Sight Feed Lubricator, Steam Gauge, Water Gauge, Whistle, Gauge Cocks, Throttle, Blow-off, Check, Stop and Safety Valve, Stack and Guy Rods, Governor with Belt, Pulleys, Pump and Heater

SPECIFICATIONS OF PORTABLE ENGINES.

Number of Size.....	0	1	2	3	4	5	6	7	8	9	10
Horse Power.....	6	8	10	12	15	20	25	30	35	40	50
Diameter of Cylinder.....inches,	5	5	6	7	8	8	9	10	10	11	12
Length of Stroke.....	8	8	9	10	10	12	12	12	15	15	16
Usual Number of Revolutions.....	185	240	190	160	160	170	170	170	150	150	150
Diameter of Pulleys.....inches,	14 & 32	14 & 32	16 & 36	20 & 44	20 & 44	30 & 48	32 & 54	32 & 54	36 & 60	36 & 60	36 & 72
Face of Pulleys.....	8½ & 8½	8½ & 8½	8½ & 9½	10½ & 10½	10½ & 10½	8½ & 12½	10½ & 12½	10½ & 12½	10½ & 14½	12½ & 14½	
Diameter of Boiler.....	26	28	30	32	32	34	36	36	40	40	40
Length of Furnace.....	34	36	38	38	44	52	52	52	52	60	60
Height of Furnace.....	30	32	34	38	38	38	40	40	44	44	44
Width of Furnace.....	21	22	24	26	26	28	30	30	34	34	34
Number of 3-inch Tubes.....	17	20	22	26	26	30	34	34	42	42	42
Length of Tubes.....inches,	54	66	72	72	78	90	96	102	102	120	144
Diameter of Stack.....	12	14	14	15	15	16	18	18	20	20	20
Length of Stack.....feet,	18	20	20	20	20	24	24	30	35	35	40



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SEMI-PORTABLE ENGINES.
20, 25, 30, 35, 40, 50 and 60 Horse-Power.

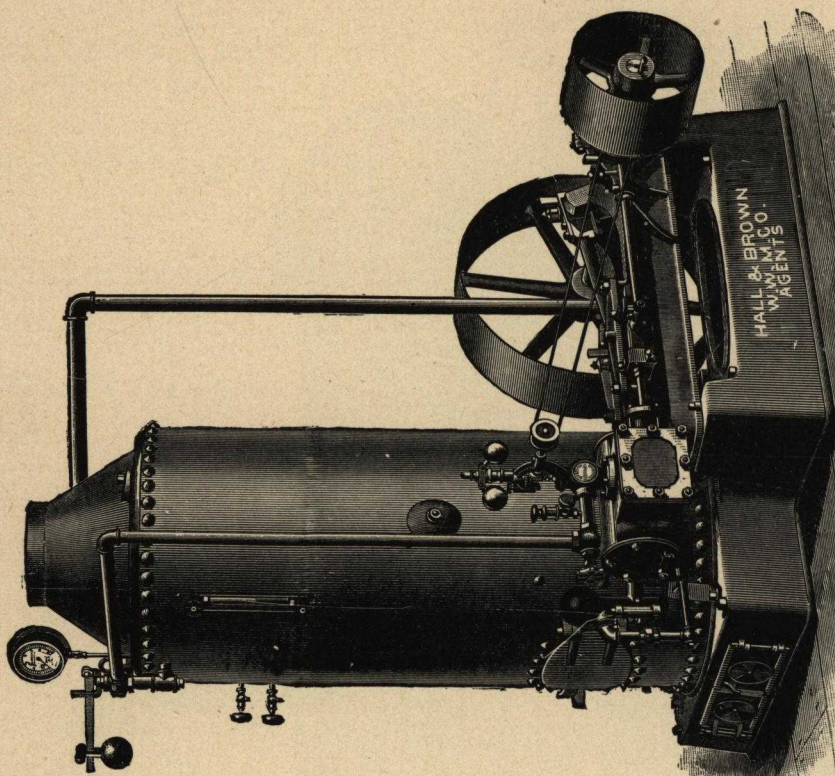
Semi-Portable Engines.

The cut on opposite page shows our Semi-Portable Engines. It is our standard Center-Crank Engine described on page 285 of our Catalogue, mounted with the Portable Boiler on extra heavy oak timber, framed and bolted together, which forms its foundation. For a Portable Outfit, we claim this far superior to the style so general in use, viz.: that of having the engine mounted on top of the boiler. The Engine being set low, is more easily attended; is not heated by the Boiler, and relieves the boiler from all strain, giving it no other than its regular duty to perform. The Crank Shaft is made longer than regular, and extends underneath the Boiler, having an out end bearing on opposite side shown in cut. Driving Pulleys are placed on each end of this shaft and are interchangeable. The Exhaust is taken from the Heater through bottom of Smoke Box and into the stack. The outfit is complete and ready to work when shipped. All steam and water connections are made at our works. Each Portable is tested under steam before shipment.

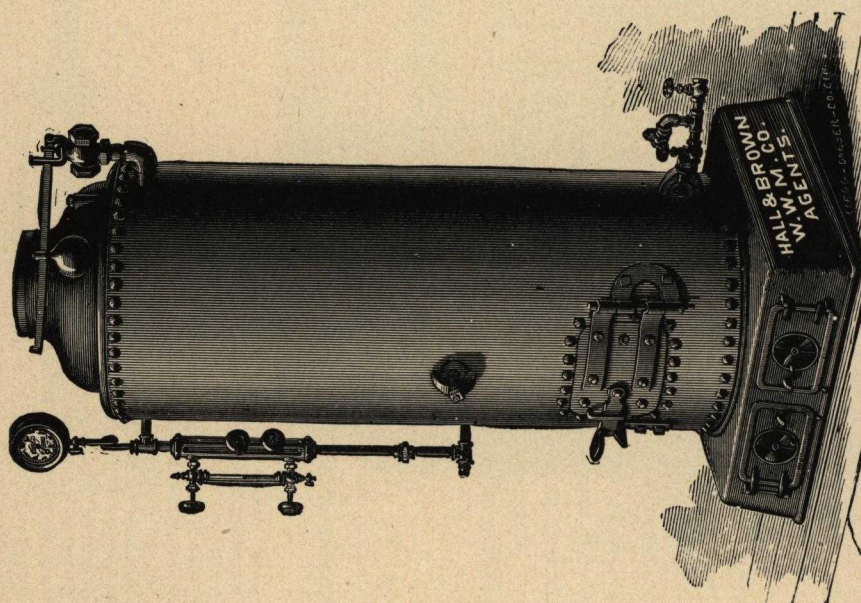
These Engines, complete, have the necessary Oil Cups, Sight Feed Lubricator, Steam Gauge, Water Gauge, Whistle, Gauge Cocks, Throttle, Blow-off, Check, Stop and Safety Valve, Governor with Belt, Pulleys, Pump, and Heater.

SPECIFICATIONS OF SEMI-PORTABLE ENGINES.

Number of Size	5	6	7	8	9	10	11
Horse Power	20	25	30	35	40	50	60
Diameter of Cylinder	8	9	10	10	11	12	13
Length of Stroke	12	12	12	15	15	16	16
Usual Number of Revolutions	170	170	170	150	150	150	150
Diameter of Pulleys	30 & 48	32 & 54	32 & 54	36 & 60	36 & 60	36 & 72	36 & 72
Face of Pulleys	8½ & 12½	10½ & 52½	10½ & 12½	10½ & 14½	10½ & 14½	12½ & 14½	12½ & 16½
Diameter of Boiler	34	36	36	40	40	40	44
Length of Furnace	52	52	52	52	60	60	60
Height of Furnace	38	40	40	44	44	44	48
Width of Furnace	28	30	30	34	34	34	38
Number of 3-inch Tubes	30	34	34	40	42	42	48
Length of Tubes	90	96	102	102	120	144	144
Diameter of Stack	16	18	18	20	20	20	22
Length of Stack	24	24	30	35	35	40	40
							feet.



COMBINED ENGINE AND BOILER.
6 to 25 Horse Power, inclusive.



VERTICAL BOILERS.
6 to 25 Horse Power. Larger sizes built to order.

Combined Engines and Vertical Boilers.

On opposite page we illustrate our Vertical Boiler and Detached Engine connected together, which we term our Combined Engine. Our attention having been called in numerous localities for an Engine and Boiler of small power, where space is also limited, we introduce this particular style, sufficient for such demands, claiming it more preferable to the many outfits offered with Vertical Engines used. The outfit complete is furnished as shown in the cut, with all trimmings and pipe connections made. The bases on which both Engine and Boiler rest can be disconnected, if desired.

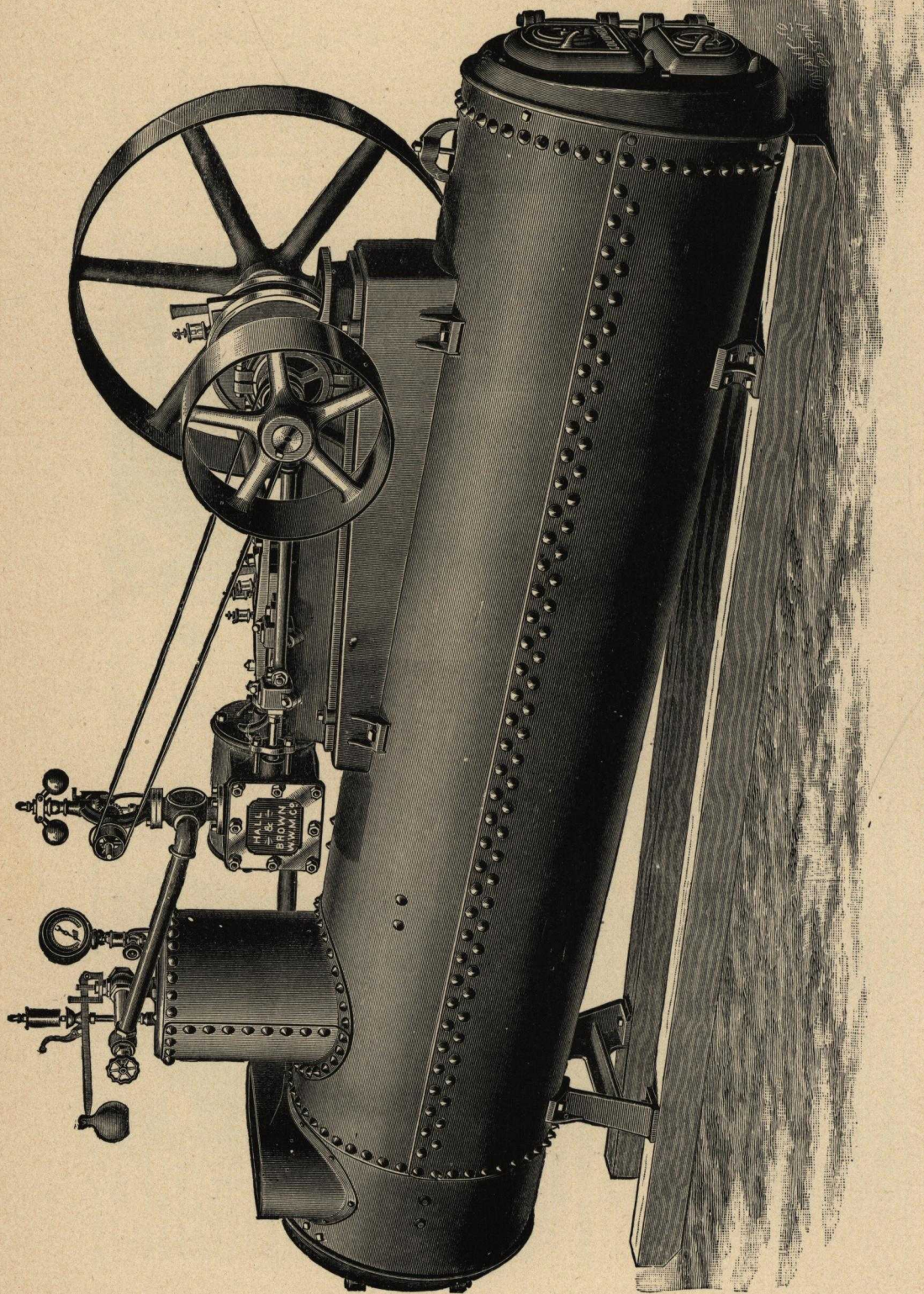
For laundries, printing offices, creameries and other like duties requiring small power, we recommend our Combined Engines to your careful consideration.

The Engine or Boiler will be furnished separately, if desired. Specifications for Engines given on page 285. Specifications of Boilers given below.

SPECIFICATIONS OF COMBINED ENGINES AND VERTICAL BOILERS.

Number of Size	0	1	2	3	4	5	6
Horse Power.....	6	8	10	12	15	20	25
Diameter of Cylinder.....	5	5	6	7	8	8	9
Length of Stroke.....	8	8	9	10	10	12	12
Usual number of revolutions.....	185	240	190	160	160	170	170
Diameter of Pulleys.....	14 & 32	14 & 32	16 & 36	20 & 44	20 & 44	30 & 48	32 & 54
Face of Pulleys.....	8½ & 8½	8½ & 8½	8½ & 9½	10½ & 10½	10½ & 10½	8½ & 12½	10½ & 10½
Diameter of Boiler.....	30	30	30	36	36	36	42
Diameter of Furnace.....	25	25	31	31	31	31	31
Height of Furnace.....	27	27	27	27	27	27	27
Length of Tubes (2 inches diam.).....	30	39	45	45	57	73	73
Number of Tubes.....	49	51	53	68	68	68	109
Size Feed Pipe.....	¾	¾	¾	¾	¾	1	1
Size Blow-Off Pipe.....	1	1	1	1	1½	¾	1½
Size of Safety Valve.....	1	1½	1½	1½	2	2	2½

These Vertical Boilers will be furnished with Tubes submerged, same dimensions, excepting height over all will be increased 14 to 20 inches on Boilers 30 and 36 inches in diameter.

**COLUMBIA PORTABLE ENGINES.**

10, 12, 15, 20, 25, 30, 35 and 40 Horse Power. Boiler Patented in U. S. A. and Canada.

“Columbia” Portable Engines.

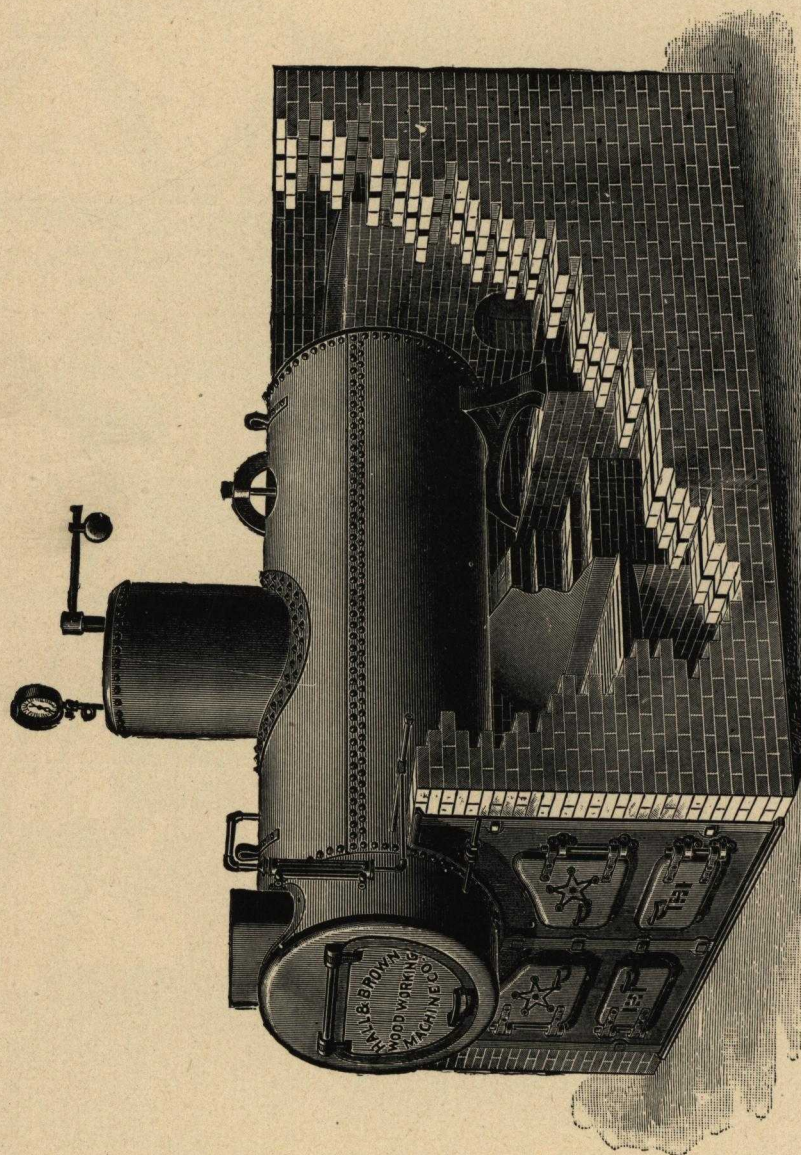
The cut on opposite page illustrates our “Columbia” Portable Engine. Our Standard Center-Crank Engine, described on page 285, is used in connection with the Columbia Boiler.

For Portable work we can safely recommend this style as desirable, particularly for Saw Mills, where refuse wood is used as fuel. The fire box being long and grates set on an incline, green slabs may safely be used for firing. The Engine may easily be detached from the Boiler and placed upon an independent foundation if desired, with no change other than additional steam pipe and foundation bolts required. Each outfit is carefully tested under steam before shipment, and when furnished complete have the necessary Oil Cups, Steam Gauge, Water Gauge, Whistle, Gauge Cocks, Blow-off, Check and Stop Valves, Safety Valve, Stack and Guy Rods, Governor with Belt, Throttle, Puleys, Pump and Heater and Sight Feed Lubricator.

SPECIFICATIONS OF “COLUMBIA” PORTABLE ENGINES.

Number of Size.	2	3	4	5	6	7	8	9
Horse Power.....	10	12	15	20	25	30	35	40
Diameter of Cylinder.....	6	7	8	8	9	10	10	11
Length of Stroke.....	9	10	10	12	12	12	15	15
Usual Number of Revolutions.....	190	160	160	170	170	170	150	150
Diameter of Pulleys.....	16 & 36	20 & 44	20 & 44	30 & 48	32 & 54	32 & 54	36 & 60	36 & 60
Face of Pulleys.....	8½ & 9½	10½ & 10½	10½ & 10½	8½ & 12½	10½ & 12½	10½ & 12½	10½ & 14½	10½ & 14½
Diameter of Boiler.....	29	32	32	36	40	42	44	48
Length of Furnace.....	45	45	51	51	66	66	66	78
Number of Tubes.....	19	30	30	35	40	40	47	54
Diameter of Tubes.....	2½	2½	2½	2½	2½	3	3	3
Length of Tubes.....	75	69	75	90	90	108	108	108
Diameter of Stack.....	15	18	18	20	22	22	24	26
Length of Stack.....	30	30	30	30	40	40	40	40

These outfits can be mounted on wheels in same manner as Portable Engine.



STATIONARY TUBULAR BOILERS WITH HALF ARCH FRONTS.

10 to 150 Horse Power.

Stationary Tubular Boilers with Half Arch Front.

The cut shown on page 294 illustrates the well-known Stationary Tubular Boiler; we need not go into detail, but favorably recommend its adoption for stationary purposes. They are made with great care from the best quality of Steel, thoroughly braced, with all longitudinal seams Double Riveted. The matter of Double Riveting adds greatly to the strength, as the U. S. Inspection Laws allows twenty per cent. more pressure to be carried on Double Riveted than on Single Riveted Boilers. Each Boiler is tested and inspected by a responsible Steam Boiler Inspection and Insurance Company at 150 pounds hydrostatic pressure, and the purchaser will receive a Policy of Insurance for one year, issued by that Company.

In comparing with other makers, the purchaser should not be governed by the rated horse-power alone, but compare the specifications below given, viz: diameter of Boiler, length and size of Flues, etc.

Boiler fixtures comprise the Arch Front, with Liners for Fire Brick, Grates, Bearers, Boiler Stand, Rear Arch Bars, Door and Frame for Rear Ash Pit, Safety Valve, Steam Gauge, Water Gauge fitted with Stand Pipe, Gauge Cock, (3) with Pipes, Whistle and Pipe, Blow-off Valve, Check Valve, Stop Valve, Smoke Stack and Guy Rods (four times the length of stack.)

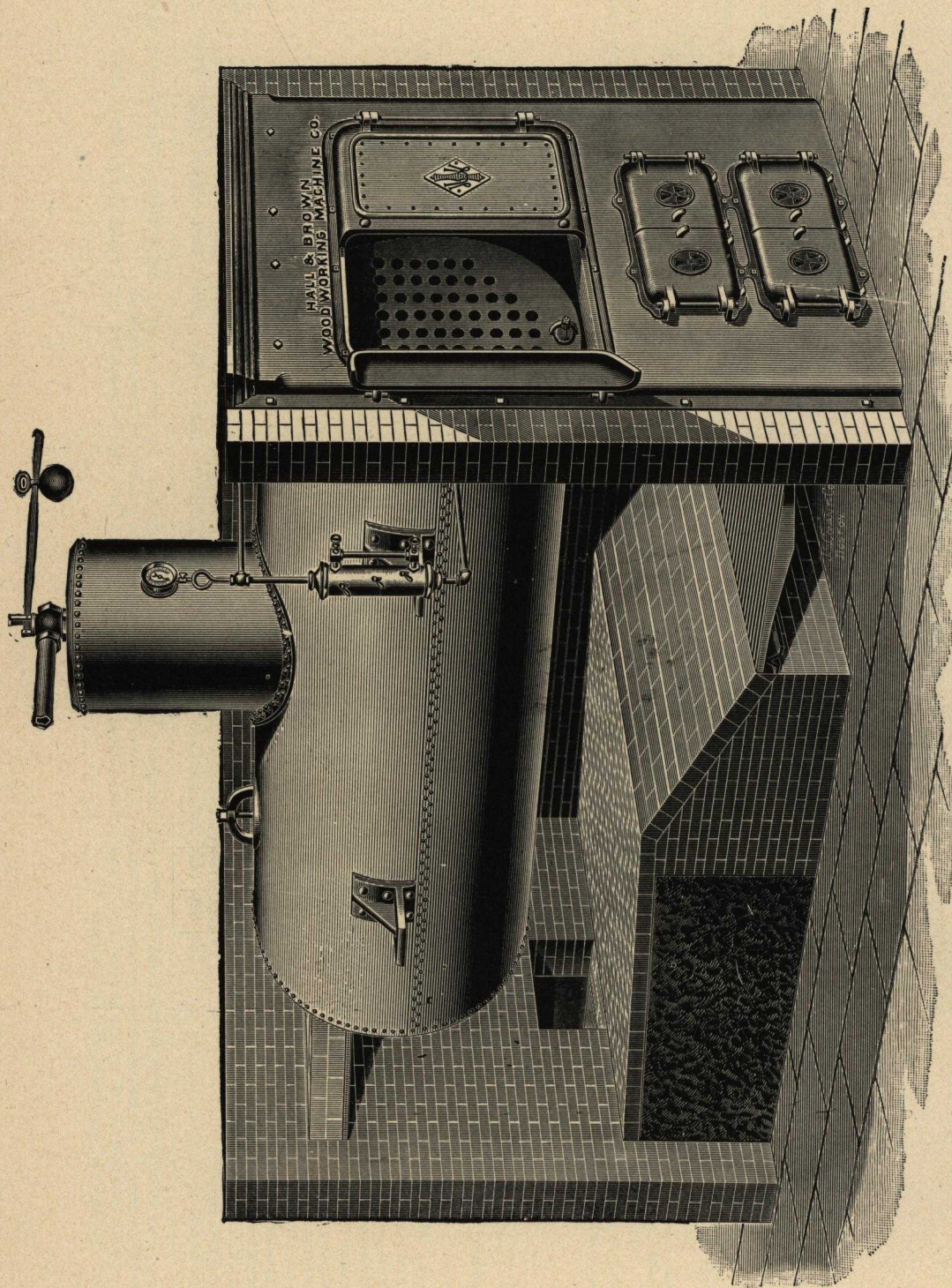
Grates for Boilers having 7 ft. tubes are 36 inches long, with 10 ft. tubes 42 inches, with 12 ft. tubes 48 inches, and with 14, 15 and 16 feet tubes 54 inches long, and the width of the grates in all cases equals the diameter of the Boiler. Sawdust Grates will be substituted for regular grates when ordered, without extra charge.

SPECIFICATIONS OF STATIONARY TUBULAR BOILERS.

(Rated at One Horse Power for each 15 Square Feet of Heating Surface.)

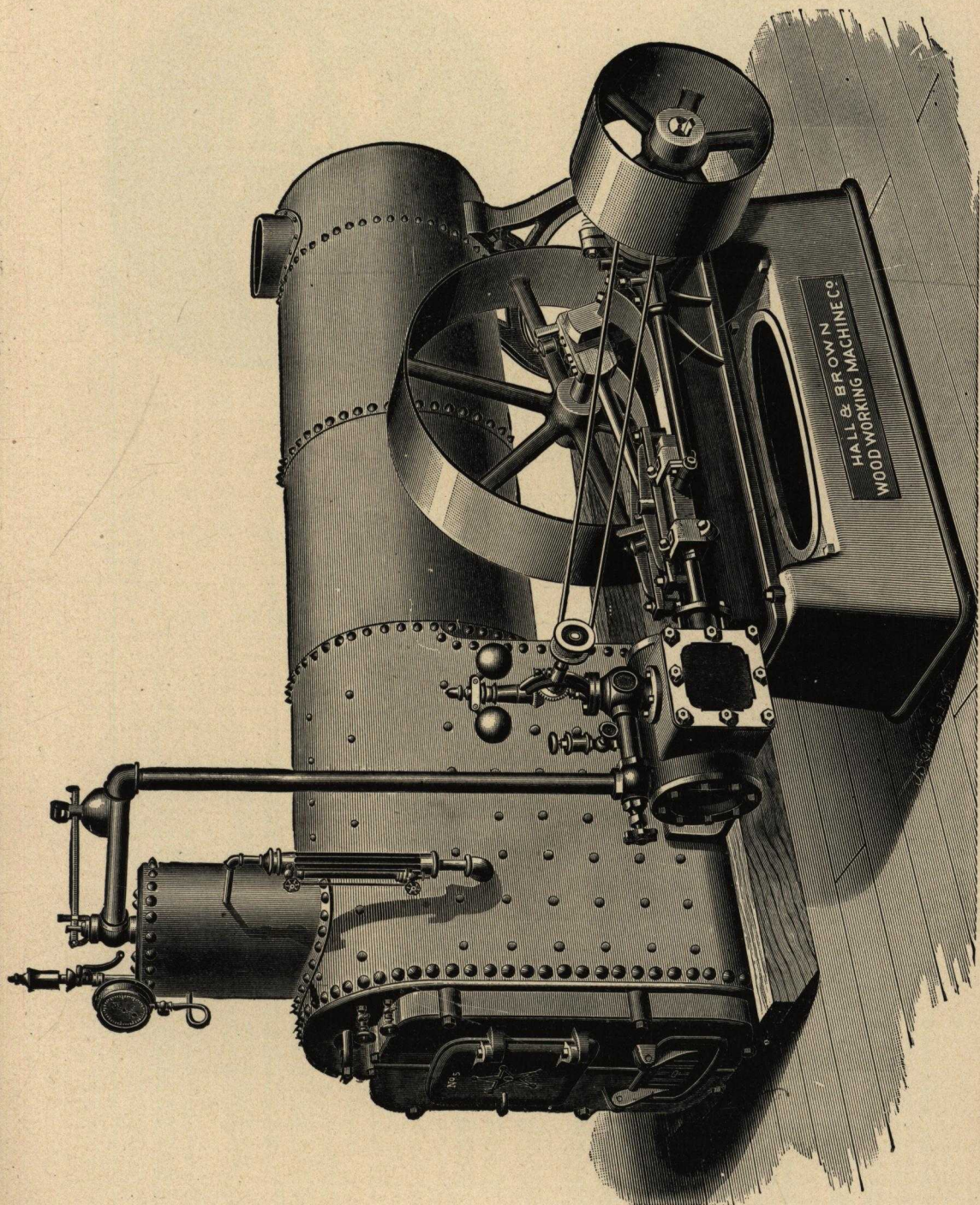
Number of Size	1	2	3	4	4½	5	6	7	7½	8	9	10	10½	11	12	13	14	15	16	17
Horse Power	10	12	15	20	20	25	30	35	40	40	45	50	60	60	70	80	90	100	125	150
Diameter of Boiler.....inches.	30	36	36	36	42	42	44	44	44	48	48	54	54	60	60	60	66	66	72	72
Thickness of Shell in Boilers, ".....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Thickness of Heads in Boilers, ".....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Length Flues.....feet.	8	8	8	8	8	10	10	12	14	12	14	12	15	12	14	16	15	16	16	18
Number 3-inch Flues.....	20	25	28	28	38	38	46	46	46	52	52	64	64	82	82	82	98	98	120	120
Square Feet Heating Surface.....	156	184	226	300	300	375	446	530	602	600	675	760	910	900	1050	1200	1350	1475	1660	1770
Height Dome.....inches.	20	22	22	24	24	24	24	24	24	28	28	34	34	36	36	36	40	40	40	40
Diameter Dome.....".....	18	20	20	20	22	22	24	24	24	28	28	30	30	32	32	32	36	36	36	36
Diameter Smoke Stack.....".....	14	16	16	16	20	20	22	22	22	24	24	26	26	28	28	28	32	32	34	34
Length of Smoke Stack.....feet.	24	24	28	28	35	35	40	50	40	40	50	40	50	40	50	60	60	60	60	60
Common Brick.....	3524	3850	4150	4635	4850	5352	5743	6500	7500	6740	7884	9610	11600	10376	11888	13022	12792	15159	16200	18000
Fire Brick.....	789	800	865	980	1100	1130	1180	1300	1350	1360	1575	1573	1600	1865	2038	2183	2363	2555	2700	2700

For setting the Front Boilers add five per cent. to above number of common brick. The above number brick does not include any allowance for waste. Allowance must be made for waste or broken brick according to the quality of brick available. Manholes will not be put in Nos. 1, 2, 3 and 4 sizes unless ordered and charged for. All larger sizes have manholes in top of shell. Additional manholes will be charged for.



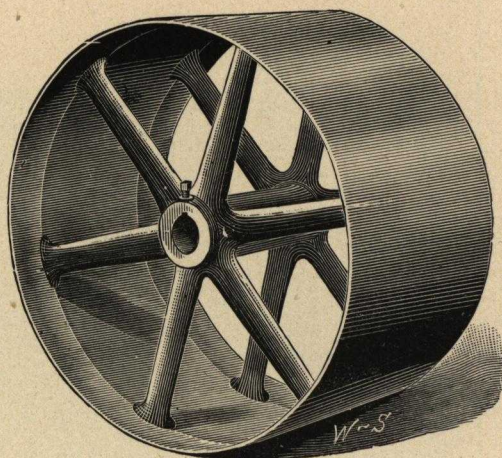
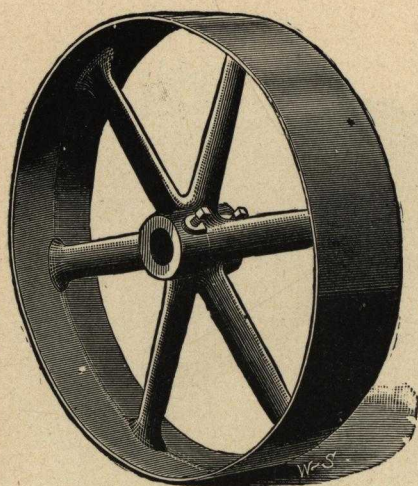
STATIONARY TUBULAR BOILERS, WITH FULL FRONT—10 to 150 Horse Power.

All Boilers tested, inspected and insured by a responsible Insurance Company.



CENTER-CRANK ENGINE WITH BOILER AND ALL CONNECTIONS COMPLETE.

We are prepared to furnish our customers with our Center-Crank Engines, 6 to 60 Horse-Power, inclusive, connected up to either Portable Boiler, as shown in cut, or the Stationary Boiler, set in brick work. Cast iron foundations for the engine, as shown in cut, from 6 to 25 horse-power, can be furnished when desired.



CAST PULLEYS.

Bored, Turned and Balanced with Key Seat or Set Screws.

Diam. in.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.	Diam. in.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.	Diam. in.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.		
6	3	\$ 1 95	\$ 2 55	.....	9	8	\$.....	\$5 10	.....	12	9	\$4 95	\$6 95	.....	
	4	2 10	2 80	.....		9	.....	5 60	.....		10	.....	7 55	.....	
	5	2 30	3 10	.....		10	.....	6 10	.....		11	.....	8 15	.....	
	6	2 55	3 45	.....		11	.....	6 60	.....		12	.....	8 75	.....	
	7	2 80	3 80	.....		12	.....	7 10	.....		14	.....	10 10	.....	
	8	3 05	4 15	.....		14	.....	8 30	.....		16	.....	11 50	.....	
	9	3 30	4 50	.....							18	.....	13 00	.....	
	10	3 60	4 85		10	3	2 55	3 35		13	3	3 05	3 95
	11	3 90	5 25			4	2 75	3 70			4	3 35	4 45
	12	4 20	5 65			5	3 05	4 10			5	3 70	5 00
							6	3 40	4 55			6	4 10	5 60
							7	3 70	5 00			7	4 45	6 20
				8	.....		5 50	.....	8	4 90	6 80		.....		
7	3	2 10	2 75	.....	10	9	.....	6 00	.....	14	9	5 25	7 45	.....	
	4	2 25	3 00	.....		10	.....	6 55	.....		10	.....	8 10	.....	
	5	2 50	3 35	.....		11	.....	7 10	.....		11	.....	8 75	.....	
	6	2 75	3 70	.....		12	.....	7 65	.....		12	.....	9 40	.....	
	7	3 00	4 05	.....		14	.....	8 90	.....		14	.....	10 85	.....	
	8	3 25	4 45	.....		16	.....	10 05	.....		16	.....	12 40	.....	
	9	3 55	4 85		11	3	2 70	3 55		18	14 00	
	10	3 85	5 25			4	2 95	3 95		20	15 70	
	11	4 20	5 70			5	3 25	4 40		14	3	3 25	4 20
	12	4 50	6 10			6	3 60	4 90			4	3 55	4 70
							7	3 95	5 40			5	3 90	5 30
							8	5 95			6	4 35	5 95
8	3	2 25	2 95	12	9	6 45	15	7		4 70	6 55	
	4	2 45	3 20		10	7 05		8		5 20	7 20	
	5	2 70	3 55	.....		11	.....	7 65	.....		9	5 60	7 90	.....	
	6	2 95	3 95	.....		12	.....	8 20	.....		10	6 10	8 60	.....	
	7	3 20	4 35	.....		14	.....	9 50	.....		11	.....	9 30	.....	
	8	3 45	4 75	.....		16	.....	10 75	.....		12	.....	10 00	.....	
	9	3 80	5 20		12	3	2 85	3 75		14	11 60	
	10	4 15	5 70			4	3 15	4 20		16	13 25	
	11	4 50	6 15			5	3 50	4 70		18	15 00	
	12	4 80	6 60			6	3 85	5 25		20	16 80	
	14	5 60	7 75			7	4 20	5 80						
							8	4 55	6 35						
9	3	2 40	3 15	.....	15	3	.....	.....	.....	15	3	3 40	4 40	.....	
	4	2 60	3 45	.....											
	5	2 85	3 80	.....											
	6	3 15	4 25	.....											
	7	3 45	4 65	.....											

Diam. In.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.	Diam. in.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.	Diam. in.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.
15	4	\$ 3 75	\$ 5 00	\$.....	19	10	\$ 8 30	\$11 95	\$.....	22	20	\$.....	\$28 30	\$32 55
	5	4 15	5 65		11	9 00	12 95		22	36 25
	6	4 60	6 30		12	9 75	14 00		24	40 00
	7	5 05	6 95		14	16 25		26	43 85
	8	5 50	7 65		16	18 50		28	47 85
	9	5 95	8 40		18	20 90		30	52 00
	10	6 45	9 15		20	26 85					
	11	6 95	9 90		22	29 65	23	3	5 15	6 70
	12	10 70		24	32 75		4	5 80	7 75
	14	12 35		26	36 00		5	6 50	8 90
	16	14 15		28	39 35		6	7 50	10 10
	18	16 00		30	42 90		7	8 05	11 40
	20	17 90							8	8 85	12 70
16	3	3 65	4 70	20	3	4 45	5 85		9	9 65	14 00
	4	4 05	5 30		4	4 95	6 65		10	10 50	15 35
	5	4 40	6 00		5	5 55	7 55		11	11 45	16 65
	6	4 85	6 70		6	6 15	8 60		12	12 40	18 00
	7	5 45	7 45		7	6 85	9 60		14	14 85	20 85
	8	5 85	8 20		8	7 50	10 60		16	23 75
	9	6 30	9 00		9	8 15	11 70		18	26 90
	10	6 85	9 90		10	8 85	12 80		20	29 95	34 45
	11	7 40	10 60		11	9 60	13 90		22	38 45
	12	8 00	11 45		12	10 40	15 00		24	42 45
	14	13 25		14	12 40	17 40		26	46 45
	16	15 15		16	19 80		28	50 70
	18	17 15		18	22 40		30	55 20
	20	19 15		20	25 00					
						22	31 85	24	3	5 40	7 00
						24	35 20		4	6 10	8 15
						26	38 60		5	6 85	9 35
						28	42 15		6	7 55	10 65
						30	47 10		7	8 45	12 00
17	3	3 80	5 00	21	3	4 70	6 15		8	9 30	13 40
	4	4 20	5 65		4	5 25	7 00		9	10 20	14 80
	5	4 70	6 40		5	5 85	8 00		10	11 10	16 20
	6	5 20	7 15		6	6 55	9 10		11	12 10	17 65
	7	5 70	7 90		7	7 25	10 20		12	13 15	19 00
	8	6 20												

CAST IRON PULLEYS,—Continued.

Diam. in.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.	Diam. in.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.	Diam. in.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.
28	3	\$ 6 75	\$ 8 70	\$.....	34	9	\$17 55	\$23 85	\$.....	40	12	\$28 80	\$ 38 75	\$.....
	4	7 70	10 10	.....		10	19 10	26 10	.....		14	32 90	44 80	.....
	5	8 50	11 55	.....		11	20 85	28 30	.....		16	.....	52 65	.....
	6	9 50	13 15	.....		12	22 50	30 50	.....		18	.....	57 50	.....
	7	10 60	14 80	.....		14	25 90	35 90	.....		20	.....	63 70	73 25
	8	11 70	16 40	.....		16	.....	40 70	.....		22	.....	69 70	80 15
	9	12 90	18 05	.....		18	.....	45 90	.....		24	.....	75 90	87 30
	10	13 10	19 80	.....		20	.....	51 65	59 40		26	.....	.....	94 55
	11	15 45	21 60	.....		22	.....	.....	64 60		28	.....	.....	101 90
	12	16 85	23 30	.....		24	.....	.....	70 50		30	.....	.....	109 10
	14	19 55	27 10	.....		26	.....	.....	76 45		32	.....	.....	116 60
	16	.....	31 10	.....		28	.....	.....	82 55		34	.....	.....	124 00
	18	.....	35 25	.....		30	.....	.....	88 20		36	.....	.....	131 35
	20	.....	39 45	45 35							38	.....	.....	138 80
	22	.....	.....	50 30	36	3	10 40	12 75	.....		40	.....	.....	146 20
	24	.....	.....	55 10		4	11 40	14 75	.....				
	26	.....	.....	60 00		5	12 65	16 95	.....	42	4	14 90	19 30	.....
	28	.....	.....	65 00		6	14 10	19 20	.....		5	16 70	22 05	.....
	30	.....	.....	70 00		7	15 70	21 45	.....		6	18 60	24 80	.....
						8	17 35	23 70	.....		7	20 55	27 55	.....
30	3	7 60	9 60	.....		9	19 10	26 00	.....		8	22 55	30 30	.....
	4	8 55	11 10	.....		10	20 85	28 30	.....		9	24 60	33 05	.....
	5	9 45	12 70	.....		11	22 70	30 70	.....		10	26 70	35 85	.....
	6	10 55	14 55	.....		12	24 50	33 10	.....		11	28 85	38 75	.....
	7	11 75	16 20	.....		14	28 10	38 55	.....		12	31 00	41 60	.....
	8	13 00	18 00	.....		16	.....	44 00	.....		14	35 30	47 95	.....
	9	14 30	19 80	.....		18	.....	49 50	.....		16	39 70	54 40	.....
	10	15 75	21 60	.....		20	.....	55 90	64 30		18	44 20	61 00	.....
	11	17 15	23 50	.....		22	.....	.....	69 45		20	49 00	67 60	77 75
	12	18 60	25 50	.....		24	.....	.....	75 70		22	54 00	74 30	85 45
	14	21 55	29 70	.....		26	.....	.....	82 00		24	59 00	81 00	93 15
	16	.....	34 20	.....		28	.....	.....	88 45		26	.....	.....	100 85
	18	.....	38 70	.....		30	.....	.....	94 95		28	.....	.....	108 60
	20	.....	43 25	49 75							30	.....	.....	116 40
	22	.....	.....	54 95	38	4	12 55	16 25	.....		32	.....	.....	124 20
	24	.....	.....	60 25		5	13 95	17 15	.....		34	.....	.....	131 95
	26	.....	.....	65 45		6	15 60	21 05	.....		36	.....	.....	139 70
	28	.....	.....	70 70		7	17 95	23 45	.....		38	.....	.....	147 50
	30	.....	.....	76 00		8	19 05	25 90	.....		40	.....	.....	155 25
						9	20 90	28 35	.....				
32	3	8 45	10 45	.....		10	22 80	30 80	.....	44	4	16 25	21 00	.....
	4	9 40	12 20	.....		11	24 75	33 35	.....		5	18 20	23 90	.....
	5	10 45	14 10	.....		12	26 65	35 95	.....		6	22 25	26 85	.....
	6	11 65	16 05	.....		14	30 50	41 65	.....		7	22 30	29 75	.....
	7	12 95	17 90	.....		16	.....	49 15	.....		8	24 45	32 70	.....
	8	14 40	19 85	.....		18	.....	53 50	.....		9	26 60	35 65	.....
	9	15 90	22 20	.....		20	.....	59 80	68 75		10	28 80	38 65	.....
	10	17 40	23 85	.....		22	.....	.....	74 80		11	31 10	41 80	.....
	11	19 00	25 90	.....		24	.....	.....	81 45		12	33 40	44 90	.....
	12	20 55	28 00	.....		26	.....	.....	88 25		14	37 90	51 60	.....
	14	23 70	32 65	.....		28	.....	.....	95 15		16	42 70	58 50	.....
	16	.....	37 45	.....		30	.....	.....	102 05		18	47 55	65 50	.....
	18	.....	42 30	.....		32	.....	.....	109 00		20	52 60	72 50	83 45
	20	.....	47 45	54 50		34	.....	.....	115 95		22	58 00	79 50	91 40
	22	.....	.....	59 80		36	.....	.....	123 00		24	63 30	86 65	99 65
	24	.....	.....	65 35		38	.....	.....	130 05		26	.....	.....	107 85
	26	.....	.....	70 90		40	.....	.....	137 10		28	.....	.....	115 10
	28	.....	.....	76 65							30	.....	.....	124 45
	30	.....	.....	81 55	40	4	13 70	17 75	.....		32	.....	.....	132 80
						5	15 30	19 60	.....		34	.....	.....	141 10
34	3	9 40	11 60	.....		6	17 10	22 90	.....		36	.....	.....	149 40
	4	10 40	13 50	.....		7	18 90	25 45	.....		38	.....	.....	157 80
	5	11 50	15 50	.....		8	20 80	28 10	.....		40	.....	.....	166 15
	6	12 90	17 60	.....		9	22 75	30 70	.....				
	7	14 35	19 70	.....		10	24 75	33 30	.....	46	4	17 65	22 75	.....
	8	15 85	21 75	.....		11	26 80	36 05	.....		5	19 70	25 80	.....

CAST IRON PULLEYS,—Continued.

Diam. in.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.	Diam. in.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.	Diam. in.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.
46	6	\$ 21 85	\$ 28 90	\$.....	50	38	\$.....	\$.....	\$189 65	56	34	\$.....	\$.....	\$199 85
	7	24 05	32 00	.....		40	.....	.....	199 85		36	.....	.....	211 60
	8	26 35	35 15	.....							38	.....	.....	223 45
	9	28 60	38 35	.....	52	5	24 50	31 85	.....		40	.....	.....	235 30
	10	30 95	41 55	.....		6	27 10	35 65	.....				
	11	33 40	44 90	.....		7	29 65	39 30	.....	58	6	32 80	43 25	.....
	12	35 80	48 20	.....		8	32 30	43 00	.....		7	35 50	47 20	.....
	14	40 60	55 30	.....		9	35 00	46 70	.....		8	38 35	51 30	.....
	16	45 70	62 60	.....		10	37 75	50 50	.....		9	41 35	55 45	.....
	18	50 90	70 00	.....		11	40 50	54 35	.....		10	44 55	59 65	.....
	20	56 30	77 40	89 00		12	43 40	58 00	.....		11	47 95	64 00	.....
	22	62 00	84 80	97 50		14	49 20	66 45	.....		12	51 50	68 50	.....
	24	67 60	92 30	106 15		16	55 30	75 05	.....		14	58 60	78 45	.....
	26	.....	.....	114 90		18	61 75	83 80	.....		16	65 90	87 85	.....
	28	.....	.....	123 70		20	68 10	92 50	106 40		18	73 50	98 50	.....
	30	.....	.....	132 50		22	74 80	101 30	116 50		20	81 00	108 85	125 20
	32	.....	.....	141 45		24	81 70	110 30	126 85		22	89 05	119 25	137 15
	34	.....	.....	150 30		26	.....	.....	137 20		24	97 15	129 80	149 25
	36	.....	.....	159 15		28	.....	.....	147 65		26	.....	.....	161 45
	38	.....	.....	168 10		30	.....	.....	158 20		28	.....	.....	173 55
	40	.....	.....	177 00		32	.....	.....	168 80		30	.....	.....	185 75
						34	.....	.....	179 50		32	.....	.....	198 25
48	4	19 00	24 50	.....		36	.....	.....	190 10		34	.....	.....	210 35
	5	21 20	27 70	.....		38	.....	.....	200 90		36	.....	.....	222 50
	6	23 50	31 00	.....		40	.....	.....	211 70		38	.....	.....	234 95
	7	25 85	34 30	.....							40	.....	.....	247 25
	8	28 25	37 65	.....	54	5	26 20	33 95	.....				
	9	30 65	41 05	.....		6	28 90	37 90	.....	60	6	34 80	46 00	.....
	10	33 15	44 45	.....		7	31 65	41 80	.....		7	37 50	50 00	.....
	11	35 70	48 00	.....		8	34 40	45 70	.....		8	40 35	54 10	.....
	12	38 20	51 50	.....		9	37 20	49 65	.....		9	43 45	58 35	.....
	14	43 30	59 00	.....		10	40 05	53 60	.....		10	46 85	62 75	.....
	16	48 70	66 70	.....		11	43 00	57 55	.....		11	50 45	67 30	.....
	18	54 20	74 50	.....		12	46 00	61 50	.....		12	54 20	72 00	.....
	20	60 00	82 30	94 65		14	52 20	70 25	.....		14	61 80	82 55	.....
	22	66 00	90 10	103 60		16	58 70	79 25	.....		16	69 60	92 15	.....
	24	72 00	98 00	112 70		18	65 50	88 50	.....		18	77 50	103 50	.....
	26	.....	.....	121 90		20	72 20	97 70	112 35		20	85 50	114 45	131 60
	28	.....	.....	131 25		22	79 30	107 00	123 05		22	93 95	125 45	144 25
	30	.....	.....	140 65		24	86 50	116 50	133 95		24	102 50	136 50	157 00
	32	.....	.....	150 05		26	.....	.....	144 90		26	.....	.....	169 80
	34	.....	.....	159 50		28	.....	.....	155 95		28	.....	.....	182 60
	36	.....	.....	168 95		30	.....	.....	167 10		30	.....	.....	195 40
	38	.....	.....	178 35		32	.....	.....	178 25		32	.....	.....	208 15
	40	.....	.....	187 80		34	.....	.....	189 40		34	.....	.....	220 90
						36	.....	.....	200 65		36	.....	.....	233 68
						38	.....	.....	212 95		38	.....	.....	246 55
						40	.....	.....	223 25		40	.....	.....	259 20
50	5	22 80	29 75	.....									
	6	25 30	33 30	.....									
	7	27 75	36 80	.....									
	8	30 25	40 30	.....	56	6	30 85	40 65	.....	62	6	36 70	48 30	.....
	9	32 80	43 85	.....		7	33 55	44 50	.....		7	39 70	52 65	.....
	10	35 45	47 45	.....		8	36 30	48 50	.....		8	42 85	57 10	.....
	11	38 10	51 15	.....		9	39 25	52 55	.....		9	45 85	61 65	.....
	12	40 80	54 80	.....		10	42 25	56 60	.....		10	49 75	66 30	.....
	14	46 20	62 70	.....		11	45 45	60 75	.....		11	53 55	71 10	.....
	16	52 00	70 85	.....		12	48 75	65 00	.....		12	57 40	76 00	.....
	18	57 95	79 15	.....		14	55 40	74 35	.....		14	65 40	86 95	.....
	20	64 00	87 40	100 50		16	62 30	83 55	.....		16	73 50	97 25	.....
	22	70 40	95 70	110 50		18	69 50	93 50	.....		18	81 60	108 70	.....
	24	76 85	104 10	119 70		20	76 60	103 25	119 75		20	90 30	120 35	138 40
	26	.....	.....	129 50		22	84 15	113 10	130 05		22	99 05	131 85	150 60
	28	.....	.....	139 45		24	91 80	123 15	141 60		24	108 00	143 20	164 70
	30	.....	.....	149 40		26	.....	.....	153 20		26	.....	.....	178 40
	32	.....	.....	158 80		28	.....	.....	164 70		28	.....	.....	191 85
	34	.....	.....	169 50		30	.....	.....	176 50		30	.....	.....	205 30
	36	.....	.....	179 50		32	.....	.....	188 25		32	.....	.....	218 50

CAST IRON PULLEYS,—Continued.

Diam. in.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.	Diam. in.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.	Diam. in.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.
62	34	\$.....	\$.....	\$232 00	68	34	\$.....	\$.....	\$266 00	74	38	\$.....	\$.....	\$335 10
	36	.....	.....	245 50		36	.....	.....	281 30		40	.....	.....	352 30
	38	.....	.....	258 55		38	.....	.....	296 70					
	40	.....	.....	272 30		40	.....	.....	312 00	76	8	61 80	79 05	.....
64	6	38 60	50 60	.....	70	6	45 10	58 40	.....		9	66 50	85 50	.....
	7	41 90	55 35	.....		7	49 20	63 85	.....		10	71 30	92 70	.....
	8	45 35	60 10	.....		8	53 30	69 25	.....		11	76 25	99 30	.....
	9	48 30	64 95	.....		9	57 40	75 00	.....		12	81 30	105 50	.....
	10	52 75	69 90	.....		10	61 70	80 70	.....		14	91 60	119 45	.....
	11	56 65	74 90	.....		11	66 05	86 40	.....		16	102 30	133 75	.....
	12	60 70	80 00	.....		12	70 60	92 40	.....		18	113 30	148 45	.....
	14	69 10	91 35	.....		14	80 05	104 85	.....		20	125 40	163 70	188 25
	16	77 50	102 35	.....		16	89 60	117 65	.....		22	137 25	179 00	205 85
	18	85 80	113 85	.....		18	99 50	130 80	.....		24	149 50	194 50	223 70
	20	95 10	126 25	145 20		20	110 40	144 55	166 25		26	.....	.....	241 30
	22	104 25	138 30	159 05		22	120 80	158 25	182 00		28	.....	.....	259 15
	24	113 50	150 90	173 55		24	130 70	172 50	198 40		30	.....	.....	276 90
	26	.....	.....	187 05		26	.....	.....	213 85		32	.....	.....	294 75
	28	.....	.....	201 15		28	.....	.....	229 70		34	.....	.....	312 55
	30	.....	.....	215 20		30	.....	.....	245 65		36	.....	.....	330 30
	32	.....	.....	228 55		32	.....	.....	261 60		38	.....	.....	348 00
	34	.....	.....	243 25		34	.....	.....	277 50		40	.....	.....	366 00
	36	.....	.....	257 35		36	.....	.....	293 40	78	8	64 75	82 35	.....
	38	.....	.....	271 30		38	.....	.....	309 45		9	69 70	89 10	.....
	40	.....	.....	285 30		40	.....	.....	325 35		10	74 70	95 90	.....
66	6	40 50	53 00	.....	72	6	47 50	61 00	.....		11	79 80	102 85	.....
	7	44 20	58 05	.....		7	51 75	66 75	.....		12	85 00	110 00	.....
	8	47 95	63 15	.....		8	56 00	72 55	.....		14	95 65	124 50	.....
	9	51 80	68 30	.....		9	60 30	78 40	.....		16	106 65	139 25	.....
	10	55 75	73 50	.....		10	64 00	84 30	.....		18	118 00	154 50	.....
	11	59 80	78 75	.....		11	69 25	90 30	.....		20	130 30	170 30	195 85
	12	64 00	84 00	.....		12	74 00	96 50	.....		22	142 65	186 10	214 00
	14	72 70	95 75	.....		14	83 75	109 45	.....		24	155 00	202 00	232 30
	16	81 50	107 55	.....		16	93 70	122 75	.....		26	.....	.....	250 65
	18	90 50	119 50	.....		18	104 00	136 50	.....		28	.....	.....	269 05
	20	99 95	132 15	152 05		20	115 70	150 60	173 20		30	.....	.....	287 45
	22	109 45	144 80	166 50		22	126 50	165 00	189 75		32	.....	.....	305 90
	24	119 00	157 50	181 10		24	136 50	179 50	207 40		34	.....	.....	324 30
	26	.....	.....	195 70		26	.....	.....	222 90		36	.....	.....	342 70
	28	.....	.....	210 40		28	.....	.....	239 45		38	.....	.....	361 10
	30	.....	.....	225 05		30	.....	.....	256 00		40	.....	.....	379 50
	32	.....	.....	239 80		32	.....	.....	272 55	80	8	67 65	85 95	.....
	34	.....	.....	254 50		34	.....	.....	289 10		9	72 80	92 90	.....
	36	.....	.....	269 20		36	.....	.....	305 65		10	78 00	99 85	.....
	38	.....	.....	283 95		38	.....	.....	322 25		11	83 30	106 95	.....
	40	.....	.....	298 65		40	.....	.....	338 80		12	88 60	114 30	.....
68	6	42 80	55 70	.....	74	8	58 90	75 70	.....		14	99 85	129 50	.....
	7	46 70	60 95	.....		9	63 40	81 90	.....		16	111 40	144 95	.....
	8	50 60	66 25	.....		10	68 00	88 50	.....		18	123 30	160 80	.....
	9	54 60	71 60	.....		11	72 75	94 80	.....		20	136 00	177 10	203 65
	10	58 70	77 10	.....		12	77 60	101 00	.....		22	148 75	193 40	222 40
	11	62 90	82 55	.....		14	87 65	114 45	.....		24	161 50	210 00	241 50
	12	67 30	88 20	.....		16	98 00	128 25	.....		26	.....	.....	260 20
	14	76 30	100 25	.....		18	108 60	142 50	.....		28	.....	.....	279 30
	16	85 50	112 55	.....		20	120 50	157 10	180 65		30	.....	.....	298 25
	18	95 00	125 10	.....		22	131 85	172 00	197 80		32	.....	.....	317 40
	20	105 15	138 35	159 10		24	143 00	187 00	215 05		34	.....	.....	336 35
	22	115 10	151 50	174 25		26	.....	.....	232 10		36	.....	.....	355 45
	24	124 90	165 00	189 75		28	.....	.....	249 25		38	.....	.....	374 55
	26	.....	.....	204 75		30	.....	.....	266 45		40	.....	.....	383 55
	28	.....	.....	220 05		32	.....	.....	283 60	82	8	70 65	89 55	.....
	30	.....	.....	235 30		34	.....	.....	300 85		9	75 90	96 70	.....
	32	.....	.....	250 70		36	.....	.....	317 95		10	81 30	103 85	.....

CAST IRON PULLEYS,—Continued.

Diam. in.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.	Diam. in.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.	Diam. in.	Face, in.	Single Belt.	Double Belt.	Double Arm Double Belt.
82	11	\$ 86 80	\$111 15	\$.....	90	34	\$.....	\$.....	\$389 05	108	18	\$.....	\$256 00	\$.....
	12	92 30	118 65	.....		36	.....	.....	421 50		20	.....	280 20	322 25
	14	104 05	134 50	.....		38	.....	.....	443 90		22	.....	304 55	350 25
	16	116 20	150 65	.....		40	.....	.....	466 30		24	.....	329 00	378 35
	18	128 60	167 10	.....							26	.....	.....	406 35
	20	141 70	183 90	211 50	96	8	.....	117 10	.....		28	.....	.....	434 45
	22	154 85	200 70	230 80		9	.....	125 85	.....		30	.....	.....	462 70
	24	168 00	218 00	250 70		10	.....	134 75	.....		32	.....	.....	491 05
	26	.....	.....	269 85		11	.....	143 85	.....		34	.....	.....	519 35
	28	.....	.....	289 50		12	.....	153 00	.....		36	.....	.....	547 65
	30	.....	.....	309 10		14	.....	172 10	.....		38	.....	.....	575 90
	32	.....	.....	328 90		16	.....	191 75	.....		40	.....	.....	604 20
	34	.....	.....	348 55		18	.....	212 50	.....				
	36	.....	.....	368 20		20	.....	233 00	267 95	114	8	.....	159 45	.....
	38	.....	.....	388 00		22	.....	254 50	292 70		9	.....	170 75	.....
	40	.....	.....	407 65		24	.....	276 00	317 40		10	.....	182 10	.....
						26	.....	.....	341 55		11	.....	193 50	.....
84	8	73 65	93 25	.....		28	.....	.....	365 70		12	.....	205 00	.....
	9	79 10	100 50	.....		30	.....	.....	390 45		14	.....	228 40	.....
	10	84 65	107 85	.....		32	.....	.....	415 15		16	.....	252 45	.....
	11	90 30	115 35	.....		34	.....	.....	439 65		18	.....	277 00	.....
	12	96 00	123 00	.....		36	.....	.....	464 15		20	.....	303 00	348 50
	14	108 35	139 60	.....		38	.....	.....	488 65		22	.....	329 50	379 40
	16	121 00	156 40	.....		40	.....	.....	513 15		24	.....	356 00	409 40
	18	134 00	173 50	.....							26	.....	.....	439 60
	20	147 45	190 75	219 25	102	8	.....	130 75	.....		28	.....	.....	470 00
	22	160 95	208 10	239 20		9	.....	140 70	.....		30	.....	.....	500 60
	24	174 50	225 50	259 30		10	.....	150 75	.....		32	.....	.....	531 30
	26	.....	.....	279 50		11	.....	160 85	.....		34	.....	.....	562 00
	28	.....	.....	299 75		12	.....	171 00	.....		36	.....	.....	592 50
	30	.....	.....	320 05		14	.....	192 00	.....		38	.....	.....	623 10
	32	.....	.....	340 40		16	.....	213 40	.....		40	.....	.....	653 70
	34	.....	.....	360 75		18	.....	233 50	.....				
	36	.....	.....	381 10		20	.....	256 25	294 70	120	8	.....	172 85	.....
	38	.....	.....	401 45		22	.....	279 05	320 90		9	.....	184 60	.....
	40	.....	.....	421 80		24	.....	302 00	347 30		10	.....	196 55	.....
						26	.....	.....	373 70		11	.....	208 65	.....
90	8	.....	104 75	.....		28	.....	.....	400 15		12	.....	221 00	.....
	9	.....	112 80	.....		30	.....	.....	426 60		14	.....	246 10	.....
	10	.....	121 00	.....		32	.....	.....	453 10		16	.....	271 75	.....
	11	.....	129 40	.....		34	.....	.....	479 65		18	.....	298 00	.....
	12	.....	138 00	.....		36	.....	.....	506 25		20	.....	325 90	374 80
	14	.....	155 60	.....		38	.....	.....	532 80		22	.....	353 80	406 90
	16	.....	173 40	.....		40	.....	.....	559 35		24	.....	382 50	439 90
	18	.....	191 50	.....							26	.....	.....	473 40
	20	.....	210 70	242 30	108	8	.....	144 35	.....		28	.....	.....	505 10
	22	.....	230 05	264 55		9	.....	154 75	.....		30	.....	.....	537 75
	24	.....	249 50	286 95		10	.....	165 35	.....		32	.....	.....	575 40
	26	.....	.....	309 30		11	.....	176 10	.....		34	.....	.....	603 10
	28	.....	.....	331 70		12	.....	187 00	.....		36	.....	.....	635 70
	30	.....	.....	354 15		14	.....	209 50	.....		38	.....	.....	668 40
	32	.....	.....	376 65		16	.....	232 50	.....		40	.....	.....	701 00

Pulleys made of any diameter above 60 inches, by inches, and of any face, at price of next larger diameter fully listed.

Intermediate Faces proportionate prices. Double Arm Double Belt Pulleys of any face. See additional prices for Split, Flange and Tight and Loose Pulleys, page 304. Either Set Screws or Key Seats will be put in Pulleys, but when both are ordered the Key Seats will be charged for extra. Keys extra, invariably.

INSTRUCTIONS FOR ORDERING PULLEYS.

Give the diameter, width of face, size of bore; state whether crowning or straight face, and whether for single or double belt.

For non-shifting belts Pulleys should have a crowning face.

For shifting belts the Driving Pulley should have a straight face.

Tight and Loose Pulleys should have crowning faces.

Additional Price to be added to List Price, for

TIGHT AND LOOSE PULLEYS, PER PAIR, AND FINISHED FLANGE PULLEYS, EACH.

Diam. in Inches.	Price. Tight and Loose Pulleys.	Price. Flanged Pulleys.	Diam. in Inches.	Price. Tight and Loose Pulleys.	Price. Flanged Pulleys.
6 to 8	\$ 1 60	\$ 4 65	41 to 44	\$ 7 90	\$26 40
9 to 10	1 95	5 20	45 to 48	8 60	29 70
11 to 12	2 30	5 75	49 to 52	9 30	33 00
13 to 14	2 65	6 30	53 to 56	10 00	36 30
15 to 16	3 00	7 15	57 to 60	10 70	40 70
17 to 18	3 30	8 00	61 to 66	11 70	46 20
19 to 20	3 70	8 80	67 to 72	12 70	51 70
21 to 22	4 05	9 90	73 to 78	13 70	57 20
23 to 24	4 40	11 00	79 to 84	14 70	62 70
25 to 26	4 75	12 10	85 to 90	15 70	68 20
27 to 28	5 10	13 75	91 to 96	16 70	73 70
29 to 30	5 45	15 40	97 to 102	17 70	79 70
31 to 32	5 80	17 05	103 to 108	18 70	85 80
33 to 34	6 15	18 70	109 to 114	19 70	91 30
35 to 36	6 50	20 35	115 to 120	20 70	96 80
37 to 40	7 20	23 10			

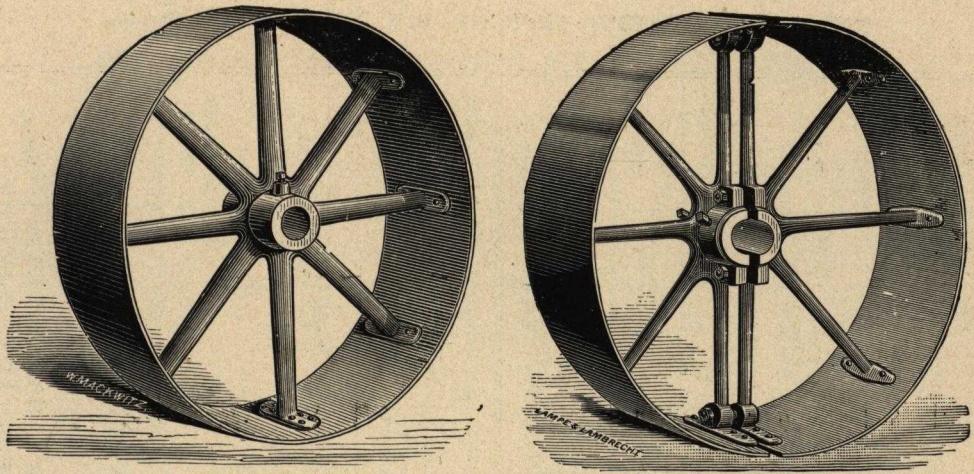
Pulleys with one Flange only, one-half that given above.

Pulleys with three Flanges, one half more than given above.

Additional Price to be added to List Prices for

FINISHED SPLIT PULLEYS.

Diam. in Inches.	Face in Inches.	Price.	Diam. in Inches.	Face in Inches.	Price.
6 to 10	2 to 3	\$ 1 30	32 to 36	11 to 14	\$ 9 80
	4 to 6	1 75		15 to 20	13 00
	7 to 10	2 15		21 to 30	19 00
	11 to 14	3 10			
	15 to 20	4 00	38 to 47	3 to 4	6 50
11 to 18	2 to 3	1 50		5 to 6	7 50
	4 to 6	2 20		7 to 10	9 90
	7 to 10	2 85		11 to 14	13 50
	11 to 14	4 00		15 to 20	18 00
	15 to 20	5 25		21 to 30	27 00
19 to 23	3 to 4	2 65		31 to 40	37 00
	5 to 6	3 40	48 to 60	5 to 6	10 00
	7 to 10	4 05		7 to 10	13 00
	11 to 14	5 60		11 to 14	18 00
	15 to 20	7 30		15 to 20	25 00
	21 to 30	11 00		21 to 30	34 50
24 to 30	3 to 4	3 60		31 to 40	48 00
	5 to 6	4 40	60 to 84	7 to 10	20 00
	7 to 10	5 40		11 to 14	26 00
	11 to 14	7 25		15 to 20	35 00
	15 to 20	10 00		21 to 30	48 00
	21 to 30	14 00		31 to 40	64 00
32 to 36	3 to 4	4 50	85 to 120	11 to 14	38 00
	5 to 6	5 60		15 to 20	53 50
	7 to 10	6 75		21 to 30	70 00
				31 to 40	90 00



THE MEDART PATENT WROUGHT RIM PULLEYS.

Diameter in inches	Face.	PRICE.	Diameter in inches	Face.	PRICE.	Diameter in inches	Face.	PRICE.	Diameter in inches	Face.	PRICE.	Diameter in inches	Face.	PRICE.
8	3	\$3 00	13	5	\$ 4 50	17	3	\$ 4 60	20	7	\$ 6 90	23	10	\$10 65
	4	3 20		6	4 80		4	4 85		8	7 35		11	11 60
	5	3 50		7	5 10		5	5 30		9	8 40		12	12 60
	6	3 80		8	5 40		6	5 75		10	9 00		14	14 90
	7	4 10		9	5 75		7	6 10		11	9 50		16	17 09
	8	4 40		10	6 10		8	6 35		12	10 25		18	19 25
9	3	3 15		11	6 70		9	6 95		14	12 40	24	3	5 85
	4	3 35		12	7 30		10	7 50		16	14 10		4	6 50
	5	3 65	14	3	4 10		11	8 00		18	15 90		5	7 10
	6	3 95		4	4 35		12	8 60	21	3	5 30		6	7 75
	7	4 25		5	4 70		14	10 10		4	5 65		7	8 50
	8	4 55		6	5 00		16	11 60		5	6 20		8	9 25
10	3	3 30		7	5 30	18	3	4 75		6	6 80		9	10 15
	4	3 50		8	5 65		4	5 05		7	7 40		10	11 10
	5	3 80		9	6 05		5	5 50		8	8 00		11	12 10
	6	4 10		10	6 50		6	6 00		9	9 00		12	13 20
	7	4 45		11	7 00		7	6 35		10	9 75		14	15 75
	8	4 75		12	7 60		8	6 70		11	10 50		16	18 00
	9	5 00		14	8 75		9	7 45		12	11 25		18	20 60
	10	5 40	15	3	4 25		10	8 00		14	13 20	25	3	6 00
11	3	3 45		4	4 50		11	8 50		16	14 90		4	6 70
	4	3 75		5	4 90		12	9 10		18	16 90		5	7 45
	5	4 05		6	5 25		14	11 00	22	3	5 45		6	8 25
	6	4 30		7	5 60		16	12 75		4	5 80		7	9 10
	7	4 65		8	5 85		18	14 25		5	6 45		8	10 00
	8	5 00		9	6 30	19	3	5 00		6	7 10		9	10 90
	9	5 25		10	6 75		4	5 30		7	8 00		10	11 90
	10	5 65		11	7 30		5	5 80		8	8 80		11	12 90
12	3	3 60		12	7 90		6	6 25		9	9 60		12	14 00
	4	3 90		14	9 00		7	6 65		10	10 30		14	16 60
	5	4 30	16	3	4 45		8	7 05		11	11 20		16	19 30
	6	4 55		4	4 70		9	7 95		12	12 10		18	22 10
	7	4 85		5	5 10		10	8 45		14	14 05	26	3	6 30
	8	5 20		6	5 50		11	8 90		16	15 60		4	7 00
	9	5 50		7	5 85		12	9 65		18	17 80		5	7 75
	10	5 85		8	6 10		14	11 60	23	3	5 65		6	8 65
	11	6 40		9	6 60		16	13 25		4	6 10		7	9 50
	12	7 00		10	7 00	20	3	5 15		5	6 70		8	10 60
13	3	3 75		11	7 65		4	5 50		6	7 40		9	11 50
	4	4 10		12	8 30		5	6 00		7	8 15		10	12 60
				14	9 50		6	6 00		8	8 95		11	13 80
				16	11 30		6	6 50		9	9 85		12	15 20

THE MEDART PATENT WROUGHT RIM PULLEYS — Continued.

Diameter. Inches.	Face. Inches.	Price.	Diameter. Inches.	Face. Inches.	Price.	Diameter. Inches.	Face. Inches.	Price.	Diameter. Inches.	Face. Inches.	Price.
26	16	20 80	31	11	18 00	36	10	20 85	46	4	18 00
	18	24 10		12	19 50		11	22 70		5	20 00
27	3	6 75		14	22 60		12	24 50		6	22 00
	4	7 30		16	26 55		14	28 10		7	24 00
	5	8 15		18	31 25		16	32 40		8	26 00
	6	9 05	32	4	9 40		18	37 00		9	28 60
	7	10 00		5	10 45	38	4	12 55		10	31 00
	8	11 10		6	11 65		5	13 95		11	33 40
	9	12 20		7	12 95		6	15 60		12	35 80
	10	13 35		8	14 40		7	17 95		14	40 60
	11	14 60		9	15 90		8	19 05		16	45 70
	12	15 90		10	17 40		9	20 90		18	50 90
	14	18 60		11	19 00		10	22 80		20	56 30
	16	22 10		12	20 55		11	24 75		22	62 00
	18	25 50		14	23 70		12	26 65		24	68 00
				16	27 75		14	30 50	48	4	21 00
28	3	7 20		18	32 50		16	36 25		5	22 50
	4	7 70	33	4	9 90		18	40 25		6	24 00
	5	8 50		5	11 00	40	4	13 70		7	26 00
	6	9 50		6	12 25		5	15 30		8	28 25
	7	10 60		7	13 60		6	17 10		9	30 65
	8	11 70		8	15 05		7	18 90		10	33 00
	9	12 90		9	16 70		8	20 80		11	35 70
	10	14 10		10	18 25		9	22 75		12	38 00
	11	15 45		11	19 90		10	24 75		14	43 00
	12	16 85		12	21 50		11	26 80		16	48 50
	14	19 55		14	24 80		12	28 80		18	54 00
	16	23 00		16	28 90		14	32 90		20	60 00
	18	26 90		18	33 40		16	37 25		22	66 00
29	4	8 10	34	4	10 40		18	41 50		24	72 00
	5	9 00		5	11 50	42	4	14 90	50	6	26 00
	6	10 00		6	12 90		5	16 70		7	28 00
	7	11 15		7	14 35		6	18 60		8	30 50
	8	12 35		8	15 85		7	20 55		9	33 00
	9	13 60		9	17 55		8	22 55		10	35 50
	10	14 90		10	19 10		9	24 60		11	38 00
	11	16 30		11	20 85		10	26 70		12	40 50
	12	17 70		12	22 50		11	28 85		14	46 00
	14	20 55		14	25 90		12	31 00		16	52 00
	16	24 20		16	30 00		14	35 30		18	58 00
	18	28 45		18	34 50		16	39 70		20	64 00
30	4	8 60	35	4	10 90		18	44 20		22	70 50
	5	9 45		5	12 10	44	18	49 00	52	24	77 00
	6	10 55		6	13 50		20	54 00		6	28 00
	7	11 75		7	15 00		22	59 00		7	30 50
	8	13 00		8	16 60		24			8	33 00
	9	14 30		9	18 25		4	16 25		9	36 00
	10	15 75		10	19 95		5	18 20		10	38 00
	11	17 15		11	21 75		6	20 25		11	40 50
	12	18 60		12	23 50		7	22 30		12	43 25
	14	21 50		14	26 90		8	24 45		14	49 25
	16	25 40		16	31 20		9	26 60		16	55 25
	18	30 00		18	35 75		10	28 80		18	61 75
31	4	9 00	36	4	11 40		11	31 10		20	68 00
	5	10 00		5	12 65		12	33 40		22	74 75
	6	11 00		6	14 10		14	37 90		24	81 75
	7	12 25		7	15 70		16	42 70	54	6	30 00
	8	13 70		8	17 35		18	47 55		7	32 50
	9	15 10		9	19 10		20	52 60		8	35 00
	10	16 50					22	58 00		9	38 00
							24	63 30			

THE MEDART PATENT WROUGHT RIM PULLEYS—Continued.

Diameter. Inches.	Face. Inches.	Price.	Diameter. Inches.	Face. Inches.	Price.	Diameter. Inches.	Face. Inches.	Price.	Diameter. Inches.	Face. Inches.	Price.
54	10	\$ 40 25	60	9	\$ 44 00	66	16	\$ 81 00	78	11	\$ 82 00
	11	43 00		10	47 00		18	90 00		12	88 00
	12	46 00		11	50 00		20	100 00		14	97 00
	14	52 25		12	55 00		22	110 00		16	108 00
	16	58 75		14	62 00	68	24	120 00		18	119 00
	18	65 50		16	68 00		8	52 00		20	132 00
	20	72 25		18	76 00		9	55 50		22	144 00
	22	80 00		20	86 50		10	59 00		24	157 00
56	24	86 50		22	95 00		11	63 00	84	10	87 00
				24	104 00		12	67 00		11	93 00
	6	32 00	62	8	44 00		14	75 50		12	98 00
	7	34 50		9	47 00		16	85 00		14	110 00
	8	37 00		10	50 50		18	94 50		16	122 50
	9	40 00		11	54 00		20	105 00		18	135 00
	10	43 00		12	58 00	70	22	115 50		20	150 00
	11	45 50		14	65 00		24	125 50		22	163 00
	12	48 75		16	73 00		8	54 50	90	24	176 00
	14	55 40		18	81 50		9	57 50		10	110 00
	16	62 30		20	91 00		10	62 00		11	114 00
	18	69 50		22	100 00		11	66 25		12	118 00
	20	77 00		24	110 00		12	70 00		14	130 00
	22	85 00					14	78 50		16	141 00
	24	93 00		8	\$ 47 00		16	87 00		18	154 00
58	6	34 00		9	50 00	72	18	97 00		20	174 00
	7	36 50		10	53 00		20	110 50		22	192 00
	8	39 00		11	57 00		22	121 00		24	215 00
	9	42 00		12	60 75		24	131 00	96	10	126 00
	10	45 00		14	68 76		8	57 50		11	131 00
	11	48 00		16	66 00		9	61 00		12	137 00
	12	52 00		18	86 00		10	65 00		14	146 00
	14	58 00		20	96 00		11	69 00		16	158 00
	16	65 00		22	105 00		12	74 00		18	170 00
	18	73 50		24	115 00	66	14	83 00		20	192 00
	20	83 00		8	49 50		16	93 00		22	212 00
	22	91 00		9	52 50		18	103 00		24	237 00
	24	99 00		10	56 00		20	115 00			
60	6	36 00		11	60 00		22	127 00			
	7	38 50		12	64 00		24	140 00			
	8	41 00		14	72 00						

Instructions for Ordering the Medart Patent Wrought Rim Pulleys.

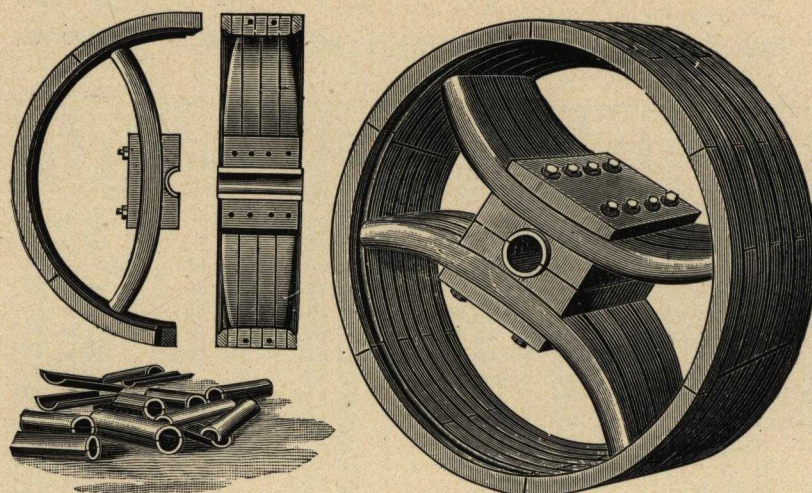
Give the diameter, width of face, size of bore; state whether whole or split, whether crowning or straight face, and in the case of crowning face pulleys it is necessary to state whether for single, double or triple belt.

In the absence of instructions to the contrary, pulleys are made for single belt strain.

Each pulley is provided with two set-screws without extra charge.

A moderate extra charge is made for keyseats, extra set-screws, and when the bore is large in comparison with the size of the pulley.

Price of Double and Triple Belt Pulleys quoted on application.



ST. LOUIS WOOD SPLIT PULLEYS.

Diameter. Inches.	Face. Inches.	Price.	Diameter. Inches.	Face. Inches.	Price.	Diameter. Inches.	Face. Inches.	Price.	Diameter. Inches.	Face. Inches.	Price.
9	3	\$2 50	13	7	\$4 00	16	10	\$ 6 30	19	6	\$ 5 50
	4	2 65		8	4 25		11	6 65		7	6 13
	5	2 90		9	4 53		12	7 00		8	6 75
	6	3 15		10	4 80		13	7 35		9	7 15
	7	3 28		11	5 20		14	7 70		10	7 50
	8	3 40		12	5 60		15	8 35		11	8 05
10	3	2 60	14	3	3 00	17	3	3 50	20	12	8 60
	4	2 75		4	3 25		4	3 85		13	9 20
	5	3 00		5	3 65		5	4 25		14	9 80
	6	3 25		6	4 10		6	4 85		15	10 70
	7	3 40		7	4 40		7	5 35		16	11 70
	8	3 55		8	4 70		8	5 85		17	12 75
11	9	3 72	15	9	5 02	18	9	6 30	21	18	13 80
	10	3 90		10	5 35		10	6 70		4	4 45
	3	2 70		11	5 68		11	7 10		5	5 20
	4	2 85		12	6 00		12	7 50		6	6 00
	5	3 10		13	6 30		13	7 88		7	6 60
	6	3 35		14	6 60		14	8 25		8	7 15
12	7	3 53	16	3	3 10	19	15	9 05	22	9	7 60
	8	3 70		4	3 45		3	3 70		10	8 00
	9	3 90		5	3 85		4	4 05		11	8 75
	10	4 10		6	4 35		5	4 55		12	9 50
	3	2 80		7	4 75		6	5 10		13	10 25
	4	2 95		8	5 10		7	5 65		14	11 00
13	5	3 20	18	9	5 48	21	8	6 20	24	15	11 80
	6	3 55		10	5 85		9	6 65		16	12 60
	7	3 70		11	6 18		10	7 10		17	13 60
	8	3 85		12	6 50		11	7 55		18	14 70
	9	4 08		13	6 85		12	8 00		4	4 70
	10	4 30		14	7 20		13	8 50		5	5 60
14	11	4 70	21	3	3 30	24	14	9 00	27	6	6 40
	12	5 10		4	3 65		15	9 80		7	6 95
	3	2 90		5	4 05		16	10 70		8	7 50
	4	3 10		6	4 60		17	11 75		9	8 10
	5	3 40		7	5 05		18	13 00		10	8 65
	6	3 75		8	5 50		4	4 25		11	9 55
15			24	9	5 90	27	5	4 80		12	10 40
										13	11 20

WOOD SPLIT PULLEYS—Continued.

Diameter. Inches.	Face. Inches.	Price.	Diameter. Inches.	Face. Inches.	Price.	Diameter. Inches.	Face. Inches.	Price.	Diameter. Inches.	Face. Inches.	Price.
21	14	\$12 00	25	8	\$ 9 20	28	6	\$ 8 60	31	4	\$8 40
	15	12 85		9	9 85		7	9 45		5	9 00
	16	13 70		10	10 90		8	10 30		6	9 85
	17	14 70		11	12 15		9	11 20		7	11 02
	18	15 80		12	13 40		10	12 10		8	12 20
22			26	13	14 80		11	13 70		9	13 17
	4	4 95		14	16 25		12	15 25		10	14 13
	5	5 90		15	17 70		13	17 10		11	15 68
	6	6 85		16	19 10		14	19 00		12	17 20
	7	7 45		17	20 55		15	21 00		13	19 52
	8	8 00		18	22 00		16	23 00		14	21 87
	9	8 70		20	30 00		17	24 95		15	24 22
	10	9 40		21	32 00		18	26 90		16	26 57
	11	10 30		22	34 00		20	33 00		17	28 85
	12	11 20		23	36 50		21	35 00		18	31 12
	13	12 10		24	39 00		22	37 00		20	35 37
	14	13 00		25	42 50		23	39 00		21	37 25
23	15	13 60	27	4	6 35	29	24	41 50	32	22	39 25
	16	14 20		5	7 00		25	44 50		23	41 25
	17	15 60		6	7 95					24	43 25
	18	17 00		7	8 80		4	7 60		25	46 00
				8	9 60		5	8 20		4	8 80
	4	5 20		9	10 05		6	9 00		5	9 40
	5	6 15		10	11 40		7	9 95		6	10 30
	6	7 05		11	12 80		8	10 90		7	11 60
	7	7 70		12	14 20		9	11 80		8	12 90
	8	8 40		13	15 85		10	12 67		9	13 95
	9	9 20		14	17 50		11	14 20		10	15 00
	10	9 95		15	19 15		12	15 87		11	16 45
24	11	11 05		16	20 80		13	17 92		12	17 90
	12	12 00		17	22 45		14	20 00		13	20 30
	13	13 00		18	24 10		15	22 10		14	22 75
	14	14 00		20	31 50		16	24 20		15	25 25
	15	15 10		21	33 50		17	26 32		16	27 75
	16	16 20		22	35 50		18	28 45		17	30 00
	17	17 00		23	37 50		20	33 75		18	32 25
	18	18 50		24	40 00		21	35 62		20	36 25
				25	43 50		22	37 62		21	38 25
	4	5 40		4	6 78		23	39 62		22	40 25
	5	6 35		5	7 40		24	41 87		23	42 25
	6	7 30		6	8 27		25	45 00		24	44 25
25	7	8 05	28	7	9 13	30			33	25	46 50
	8	8 80		8	9 95		4	8 00		4	9 20
	9	9 65		9	10 63		5	8 60		5	9 95
	10	10 45		10	11 75		6	9 40		6	10 90
	11	11 55		11	13 25		7	10 45		7	12 30
	12	12 70		12	14 72		8	11 50		8	13 70
	13	13 90		13	16 47		9	12 40		9	14 85
	14	15 10		14	18 25		10	13 25		10	16 00
	15	16 30		15	20 17		11	14 90		11	17 47
	16	17 50		16	21 90		12	16 50		12	18 95
	17	18 75		17	23 70		13	18 75		13	21 45
	18	20 00		18	25 50		14	21 00		14	23 62
	20	28 50		20	32 25		15	23 20		15	26 25
25	21	30 50		21	34 25		16	25 40		16	28 87
	22	32 50		22	36 25		17	27 70		17	31 12
	23	35 00		23	38 25		18	30 00		18	33 37
	24	37 50		24	40 75		20	34 50		20	37 00
	25	41 00		25	44 00		21	36 25		21	39 50
25	4	5 80	28	4	7 20	30	22	38 25	33	22	41 50
	5	6 65		5	7 80		23	40 25		23	43 50
	6	7 60					24	42 25		24	45 50
	7	8 40					25	45 50			

WOOD SPLIT PULLEYS—Continued.

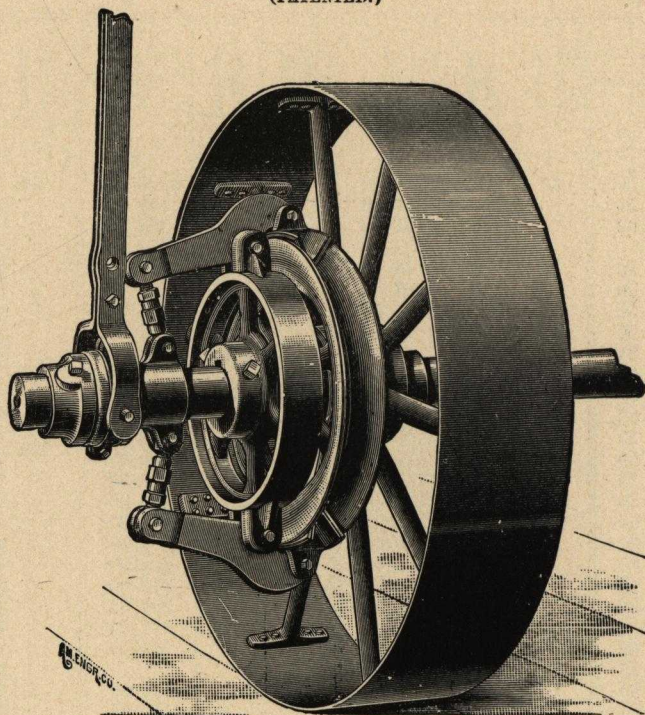
Diameter. Inches.	Face. Inches.	Price.	Diameter. Inches.	Face. Inches.	Price.	Diameter. Inches.	Face. Inches.	Price.	Diameter. Inches.	Face. Inches.	Price.
56	23	\$ 98 00	66	23	\$122 50	90	16	\$144 00	108	20	\$280 00
	24	102 50		24	130 00		17	149 00		22	304 00
	25	106 00		25	137 50		18	154 00		24	329 00
58	8	43 50	72	10	64 00		20	174 00		26	353 00
	9	46 00		11	67 50		21	183 00		28	377 00
	10	47 50		12	71 50		22	192 00		30	402 00
	11	50 00		13	75 50		23	204 00		32	427 00
	12	52 25		14	80 00		24	217 00		34	451 00
	13	55 00		15	85 00		25	230 00		36	476 00
	14	57 75		16	90 00	96	12	140 00		38	500 00
	15	61 00		17	95 00		13	145 00		40	525 00
	16	64 25		18	100 00		14	150 00	114	8	159 00
	17	68 50		20	115 00		15	155 00		9	170 00
	18	73 75		21	127 00		16	160 00		10	182 00
	20	87 50		22	131 00		17	165 00		11	193 00
	21	90 50		23	136 00		18	170 00		12	205 00
	22	95 25		24	145 00		20	192 00		14	228 00
	23	100 00		25	155 00		21	202 00		16	252 00
	24	104 50					22	212 00		18	277 00
	25	110 00	78	12	95 00		23	224 00		20	303 00
60	8	47 00		13	99 00		24	237 00		22	329 00
	9	49 25		14	104 00		25	250 00		24	356 00
	10	51 50		15	109 00	102	8	130 00		26	382 00
	11	53 75		16	114 00		9	140 00		28	408 00
	12	56 00		17	119 00		10	150 00		30	435 00
	13	59 00		18	124 00		11	160 00		32	462 00
	14	62 00		20	134 00		12	171 00		34	488 00
	15	65 25		21	140 00		14	192 00		36	515 00
	16	68 50		22	146 00		16	213 00		38	541 00
	17	73 25		23	156 00		18	233 00		40	568 00
	18	78 00		24	168 00		20	256 00	120	8	172 00
	20	91 00		25	180 00		22	279 00		9	184 00
	21	96 00	84	12	110 00		24	302 00		10	196 00
	22	101 00		13	114 00		26	324 00		11	208 00
	23	106 00		14	119 00		28	347 00		12	221 00
	24	111 00		15	124 00		30	370 00		14	246 00
	25	116 00		16	129 00		32	394 00		16	271 00
66	10	57 00		17	134 00		34	417 00		18	298 00
	11	60 00		18	139 00		36	440 00		20	325 00
	12	63 50		20	154 00		38	463 00		22	353 00
	13	67 50		21	162 00		40	486 00		24	382 00
	14	71 50		22	170 00	108	8	144 00		26	410 00
	15	75 50		23	181 00		9	154 00		28	439 00
	16	80 00		24	193 00		10	165 00		30	467 00
	17	84 50		25	205 00		11	176 00		32	496 00
	18	89 00	90	12	125 00		12	187 00		34	524 00
	20	103 00		13	129 00		14	209 00		36	552 00
	21	109 00		14	134 00		16	232 00		38	581 00
	22	115 00		15	139 00		18	256 00		40	609 00

ENGINE BAND WHEELS.

PRICES QUOTED ON APPLICATION.

FRICTION CLUTCH PULLEYS.

(PATENTED.)



Realizing the necessities of the times, and the demand of our customers for the best obtainable devices, we have striven to improve many articles of our manufacture.

We have given particular attention to improvements in Friction Clutch Pulleys and Cut-off Couplings, and can safely state that we have succeeded in devising a Friction Clutch which is at once simple in construction, very powerful, durable, occupies less space on shaft, and is lighter than any other Clutch on the market.

Through our system of testing we are able to supply our customers with Clutches of known horse-power, as we make it a point to test each and every Clutch sent out, and know absolutely just what power they will transmit. We are prepared to furnish Clutches for Pulleys of any size from 8 inches diameter upwards, and with two, four or six arms, according to the size of the Pulleys and the duty for which they are wanted. The simplicity of construction of these Clutches enables us to sell them at very low prices and yet maintain a high standard of excellence in workmanship. These Clutches are self-locking, and can be started and stopped gradually and without shock of jar. We have sold numerous Clutches to Electric Light and Electric Street Railroad Companies for the very heaviest duty, and can recommend them for all classes of work where strength and durability are required. They are specially adapted for high speeds. Our Clutches are sold under a guarantee, we agreeing that should they not come up to our representations to take them back, we paying freight charges both ways, and either replace them or refund the money paid.

We make two grades of Friction Clutch Pulleys, one to transmit full power of single leather belt and the other to transmit full power of double leather belt, and guarantee them as above mentioned. We can furnish Split Friction Clutch Pulleys at a moderate advance on price of Whole Clutch Pulleys.

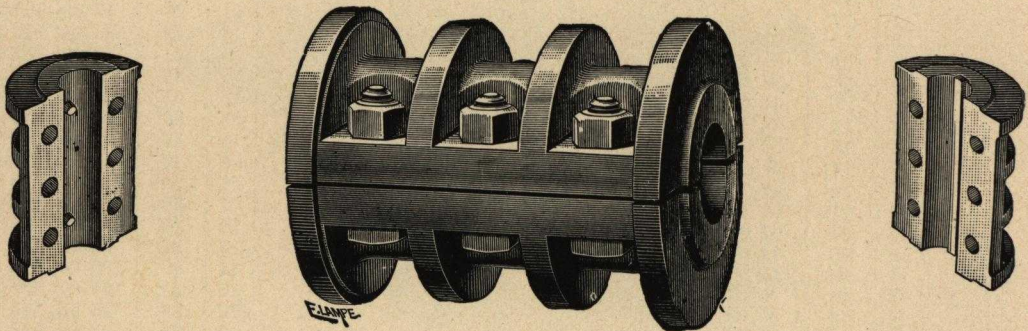
Diam-eter.	Face Inches.	Space on Shaft, Inches	PRICE.		Diam-eter.	Face Inches.	Space on Shaft, Inches	PRICE.		Diam-eter.	Face Inches.	Space on Shaft, Inches	PRICE.	
			Single Belt.	Double Belt.				Single Belt.	Double Belt.				Single Belt.	Double Belt.
10	3	14	\$22 00	\$23 40	11	3	14	22 65	23 20	12	3	14	23 30	23 80
	4	15	22 90	23 40		4	15	23 60	24 10		4	15	24 10	24 70
	5	17	23 80	25 40		5	17	24 50	25 90		5	17	25 10	26 90
	6	18	25 60	27 25		6	18	26 10	28 30		6	18	27 00	29 60
	8	21	27 60	30 60		8	21	29 00	31 90		8	21	30 10	33 00

Diam- eter.	Face Inches.	Space on Shaft, Inches	PRICE.		Diam- eter.	Face Inches.	Space on Shaft, Inches	PRICE.		Diam- eter.	Face Inches.	Space on Shaft, Inches	PRICE.	
			Single Belt.	Double Belt.				Single Belt.	Double Belt.				Single Belt.	Double Belt.
12	10	23	\$ 33 40	\$ 36 00	21	16	29	\$ 55 00	\$ 68 00	34	4	17	\$ 50 00	\$ 60 00
13	3	14	23 90	24 40	22	4	16	29 50	32 00		5	18	55 00	63 00
	4	15	24 60	25 25		5	18	34 00	37 00		6	19	60 00	68 00
	5	17	25 90	28 00		6	19	37 50	41 00		8	21	66 00	74 00
	6	18	28 60	31 60		8	21	41 00	45 00		10	23	73 00	80 00
	8	21	32 00	34 60		10	23	45 50	50 00		12	25	79 00	88 00
	10	23	34 50	36 80		12	25	48 00	54 00		14	27	90 00	98 00
14	3	14	24 50	25 00		14	27	53 00	58 00		16	29	96 00	108 00
	4	15	25 50	26 00		16	29	60 00	69 00		18	31	108 00	126 00
	5	17	27 00	29 00		18	31	64 00	76 00		20	33	122 00	141 00
	6	18	29 70	33 00	23	4	16	31 50	34 00	36	4	17	55 00	64 00
	8	21	33 00	35 00		5	18	36 00	39 00		5	18	62 00	67 00
	10	23	35 00	38 00		6	19	39 00	43 00		6	19	67 00	72 00
	12	25	37 00	41 00		8	21	44 00	47 00		8	21	72 00	77 00
15	3	14	25 00	25 60		10	23	48 00	52 00		10	23	80 00	85 00
	4	15	26 00	27 00		12	25	51 00	56 00		12	25	88 00	95 00
	5	17	28 50	30 50		14	27	56 00	61 00		14	27	97 00	105 00
	6	18	31 34	34 00		16	29	63 00	70 00		16	29	104 00	115 00
	8	21	34 00	36 00		18	31	69 00	79 00		18	31	118 00	132 00
	10	23	36 00	40 00	24	4	16	32 00	36 00		20	33	131 00	150 00
	12	25	41 00	44 00		5	18	38 00	42 00		22	35	140 00	162 00
16	3	14	25 50	26 20		6	19	40 50	44 00		24	37	150 00	180 00
	4	16	26 50	27 50		8	21	45 00	49 00	38	4	18	58 00	66 00
	5	17	29 00	31 00		10	23	51 50	56 00		5	19	64 00	70 00
	6	18	32 25	34 50		12	25	55 00	60 00		6	20	70 00	75 00
	8	21	34 50	36 50		14	27	59 00	64 00		8	22	75 00	80 00
	10	23	37 00	41 00		16	29	64 00	71 00		10	25	85 00	90 00
	12	25	42 00	45 00		18	31	72 00	81 00		12	27	90 00	100 00
	14	27	44 00	50 00		20	33	82 00	91 00		14	29	100 00	112 00
17	3	14	26 00	26 60	26	4	17	37 00	42 00		16	31	108 00	122 00
	4	16	27 00	28 00		5	18	43 00	46 00		18	33	120 00	136 00
	5	17	29 50	32 00		6	19	47 00	51 00		20	35	133 00	158 00
	6	18	33 00	35 00		8	21	53 00	57 00		22	37	146 00	168 00
	8	21	35 05	37 00		10	23	59 00	63 00		24	39	160 00	184 00
	10	23	37 50	41 50		12	25	63 00	67 00	40	4	18	60 00	68 00
	12	25	42 50	45 50		14	27	69 00	73 00		5	19	67 00	73 00
	14	27	44 00	51 00		16	29	75 00	80 00		6	20	73 00	79 00
18	3	14	26 50	27 50		18	31	84 00	90 00		8	22	81 00	86 00
	4	16	27 50	28 50		20	33	93 00	100 00		10	25	90 00	97 00
	5	17	30 00	32 59	28	4	17	42 00	48 00		12	27	94 00	107 00
	6	18	33 50	36 00		5	18	46 00	50 00		14	29	106 00	117 00
	8	21	35 50	40 00		6	19	50 00	55 00		16	31	111 00	128 00
	10	23	39 90	44 00		8	21	55 00	59 00		18	33	125 00	145 00
	12	25	43 50	47 00		10	23	61 00	65 00		20	35	139 00	164 00
	14	27	46 00	52 00		12	25	66 00	71 00		22	37	154 00	175 00
	16	29	49 00	57 00		14	27	74 00	78 00		24	39	166 00	190 00
19	4	16	28 00	20 00		16	29	79 00	80 00	42	4	18	63 00	70 00
	5	17	31 00	33 50		18	31	89 00	98 05		5	19	69 00	76 00
	6	18	34 00	37 00		20	33	100 00	110 00		6	20	75 00	84 00
	8	21	38 00	42 00	30	4	17	44 00	52 00		8	22	84 00	91 00
	10	23	41 00	46 00		5	18	49 00	55 00		10	25	93 00	101 00
	12	25	44 00	48 00		6	19	54 00	60 00		12	27	99 00	112 00
	14	27	47 00	54 00		8	21	58 00	65 00		14	29	108 00	125 00
	16	29	50 00	60 00		10	23	65 00	70 00		16	31	116 00	136 00
20	4	16	28 50	29 50		12	25	70 00	75 00		18	33	130 00	155 00
	5	18	31 00	34 00		14	27	79 00	83 00		20	35	144 00	170 00
	6	19	34 50	37 00		16	29	86 00	91 00		22	37	160 00	185 00
	8	21	40 00	43 00		18	31	95 00	106 00		24	39	175 00	200 00
	10	23	42 00	47 00		20	33	109 00	122 00	44	4	18	68 00	75 00
	12	25	45 00	51 00	32	4	17	47 00	56 00		5	19	74 00	81 00
	14	27	49 50	56 00		5	18	52 00	59 00		6	20	81 00	90 00
	16	29	53 00	63 00		6	19	57 00	62 00		8	22	90 00	100 00
21	4	16	29 00	30 50		8	21	62 00	68 00		10	25	190 00	110 00
	5	18	32 00	46 00		10	23	67 00	74 00		12	27	107 00	120 00
	6	19	36 00	40 50		12	25	74 00	80 00		14	29	118 00	134 00
	8	21	40 50	44 00		14	27	83 00	88 00		16	31	126 00	146 00
	10	23	44 50	49 00		16	29	91 00	91 00		18	33	140 00	165 00
	12	25	46 00	53 00		18	31	102 00	118 00		20	35	150 00	185 00
	14	27	50 00	57 00		20	33	117 00	133 00		22	37	170 00	205 00

FINISHED SHAFTING.

Diameter.....	1	1 $\frac{3}{8}$	1 $\frac{5}{8}$	1 $\frac{7}{8}$	1 $\frac{1}{2}$	1 $\frac{11}{8}$	1 $\frac{5}{4}$	2 $\frac{3}{8}$
Price per Foot.....	\$0.60	.70	.75	.75	.83	.90	1.05	1.30
Price per Foot for all Keyseats Other than for Couplings Finished } Diameter.....	.30	.35	.35	.40	.40	.45	.50	.55
Price per Foot.....	2 $\frac{7}{8}$	2 $\frac{11}{8}$	2 $\frac{15}{8}$	3 $\frac{3}{8}$	3 $\frac{7}{8}$	3 $\frac{11}{8}$	4 $\frac{7}{8}$	4 $\frac{15}{8}$
Price per Foot.....	\$1.60	1.85	2.25	2.80	3.10	4.15	6.10	7.75
Price per Foot for all Keyseats Other than for Couplings Finished } Diameter.....	.60	.65	.70	.80	.90	1.00	1.30	1.50

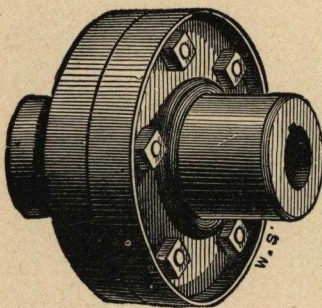
IMPROVED COMPRESSION COUPLINGS.




Size.....	1 $\frac{3}{8}$	1 $\frac{5}{8}$	1 $\frac{7}{8}$	1 $\frac{1}{2}$	1 $\frac{11}{8}$	1 $\frac{5}{4}$	2 $\frac{3}{8}$
Price per pair.....	\$4.00	4.25	4.50	4.75	5.25	6.00	7.00
Price fitted.....	5.60	6.00	6.30	6.60	7.30	8.25	9.50
Size.....	2 $\frac{7}{8}$	2 $\frac{11}{8}$	2 $\frac{15}{8}$	3 $\frac{3}{8}$	3 $\frac{7}{8}$	3 $\frac{11}{8}$	3 $\frac{15}{8}$
Price per pair.....	8.00	9.00	10.00	11.25	12.50	14.25	16.25
Price fitted.....	10.60	13.00	14.50	16.25	17.70	19.85	22.50

FLANGED FACE COUPLINGS.

TURNED, FACED AND FINISHED, WITH BOLTS, KEYS AND
KEYWAYS, COMPLETE.

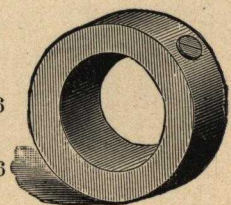


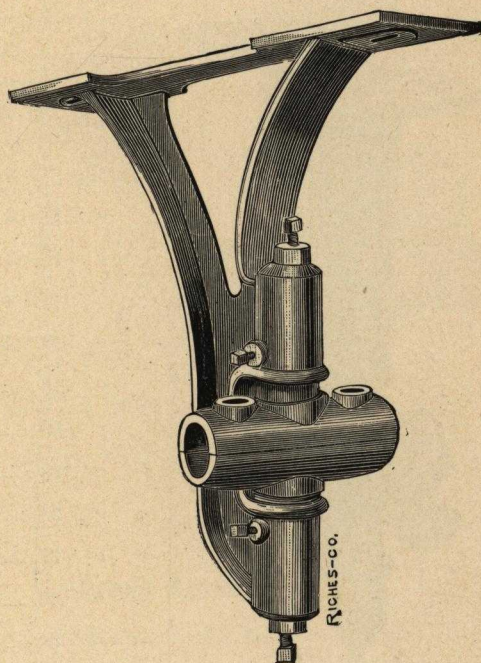
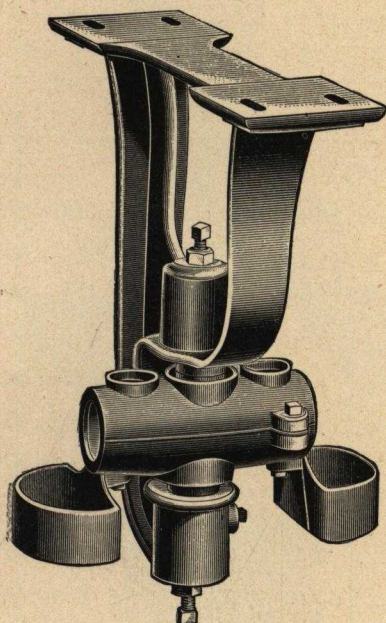


Size.....	1 $\frac{3}{8}$	1 $\frac{5}{8}$	1 $\frac{7}{8}$	1 $\frac{1}{2}$	1 $\frac{11}{8}$		
Price.....	\$6.00	6.25	6.75	7.00	7.50		
Price fitted.....	8.50	8.75	9.50	9.50	10.25		
Size.....	1 $\frac{5}{8}$	2 $\frac{3}{8}$	2 $\frac{7}{8}$	2 $\frac{11}{8}$	2 $\frac{15}{8}$		
Price.....	\$8.50	10.00	12.00	14.50	17.50		
Price fitted.....	11.50	13.25	15.50	18.50	22.00		
Size.....	3 $\frac{3}{8}$	3 $\frac{7}{8}$	3 $\frac{11}{8}$	3 $\frac{15}{8}$	4 $\frac{3}{8}$	4 $\frac{7}{8}$	4 $\frac{15}{8}$
Price.....	\$20.50	23.50	27.50	31.00	35.00	40.00	50.00
Price fitted.....	25.50	29.00	33.50	37.00	41.00	46.00	57.00

SET COLLARS WITH CASE HARDENED SCREWS.

Size Shafting...	1 3-16	1 7-16	1 11-16	1 15-16	2 3-16	2 7-16
Price, each.....	\$1.10	1.35	1.54	1.80	2.00	2.20
Size Shafting...	2 11-16	2 15-16	3 3-16	3 7-16	3 11-16	3 15-16
Price, each... ..	\$2.40	2.60	2.80	3.00	3.30	3.50

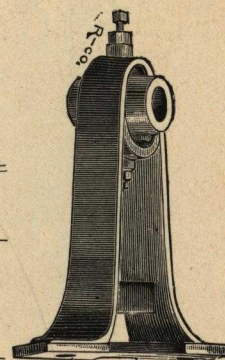



IMPROVED BALL AND SOCKET ADJUSTABLE DROP HANGERS.

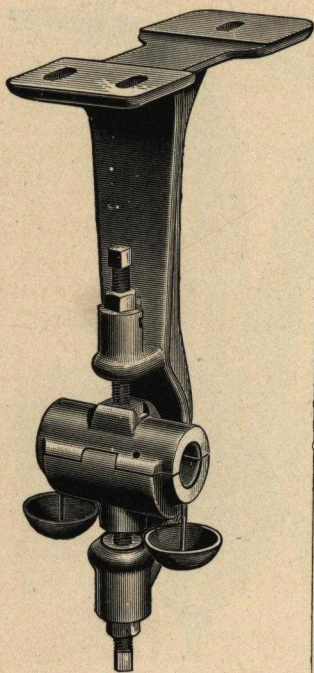
Diameter of Shaft.	$1\frac{1}{16}$	$1\frac{5}{16}$	$2\frac{3}{16}$	$2\frac{7}{16}$	$2\frac{1}{2}$	$2\frac{5}{8}$
Drop in inches.						
16	\$ 7 60	\$ 8 65	\$ 9 60	\$11 75	\$14 15	\$16 75
18	7 95	9 00	10 00	12 15	14 85	17 55
20	8 30	9 35	10 55	12 50	15 40	18 35
25	.....	.....	11 75	14 25	17 20	20 25

REVERSIBLE FLOOR OR CEILING COUNTERSHAFT HANGERS.

Diameter of Shaft.	$1\frac{3}{16}$	$1\frac{5}{16}$	$1\frac{7}{16}$	$1\frac{1}{2}$	$1\frac{5}{8}$
Drop in inches.					
10	\$2 50	\$3 50	\$4 00	\$4 50	\$5 00
12	3 00	4 00	4 50	5 00	5 50
14	.....	.....	5 00	5 50	6 00

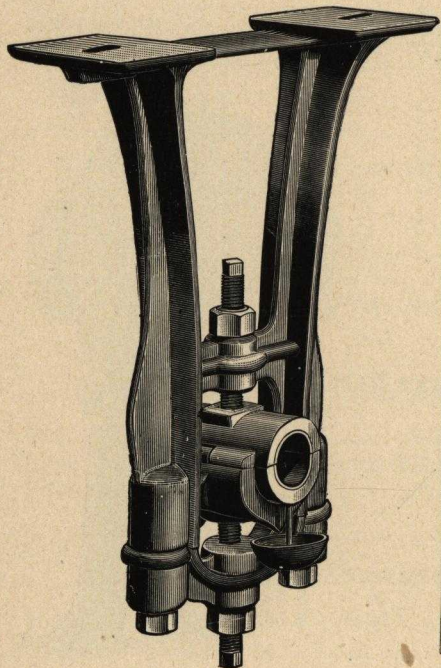


SINGLE BRACE DROP HANGERS AND FLOOR STANDS.



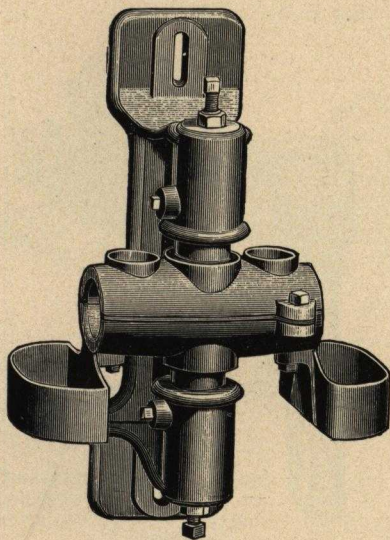
Diameter of Shaft.	$1\frac{3}{8}$	$1\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$2\frac{3}{8}$	$2\frac{7}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$
Length of Bearing.	5½	6	6½	7	7½	8	8½	9
Drop in Inches, 8	\$ 3 00	\$ 4 45	\$ 5 50	\$ 6 20	\$ 6 90	.....	.....	.....
" " 10	3 45	4 65	5 70	6 40	7 20	\$ 8 40	\$ 9 20	\$10 80
" " 12	3 90	4 90	5 90	6 60	7 50	8 80	9 80	11 30
" " 14	4 10	5 15	6 10	6 90	7 80	9 30	10 40	11 80
" " 16	4 30	5 40	6 30	7 20	8 10	9 80	11 00	12 30
" " 18	.....	5 60	6 60	7 50	8 40	10 30	12 00	13 00
" " 20	.....	5 90	6 90	7 80	8 70	10 80	13 00	13 90
" " 22	.....	.....	7 25	8 40	9 60	11 30	14 00	14 80
" " 24	.....	.....	7 90	9 10	10 50	12 00	15 00	15 60
" " 27	.....	.....	.....	9 50	11 00	13 00	15 50	16 50
" " 30	.....	.....	.....	10 00	12 00	14 00	16 00	17 50
" " 36	.....	.....	.....	.....	.....	15 00	16 50	18 50

DOUBLE BRACE DROP HANGERS AND FLOOR STANDS.

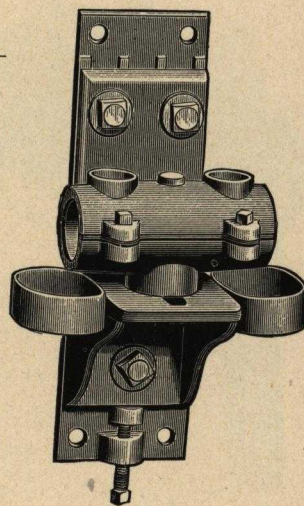


Dia. of Shaft.	$1\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$2\frac{3}{8}$	$2\frac{7}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$
Leng. of Bearing	6	6½	7	7½	8	8½	9
Drop in in. 10	\$ 4 90	\$ 5 90	\$ 7 10	\$ 8 70	\$10 20	\$12 35	\$14 40
" 12	5 05	6 25	7 40	9 00	10 60	12 70	15 00
" 14	5 25	6 45	7 75	9 40	11 00	13 05	15 50
" 16	5 50	6 60	8 10	9 70	12 50	14 10	16 50
" 18	5 80	6 75	8 40	10 00	12 90	14 85	17 00
" 20	6 10	6 90	8 70	10 30	13 30	15 20	17 75
" 22	.....	7 70	9 10	10 60	13 70	15 65	18 25
" 24	.....	8 25	9 30	11 00	14 00	16 00	19 00
" 27	.....	.....	9 50	11 85	14 75	16 50	19 50
" 30	.....	.....	10 00	12 50	15 50	17 00	20 25
" 36	.....	.....	.....	.....	16 25	17 50	22 00

ADJUSTABLE POST HANGERS.

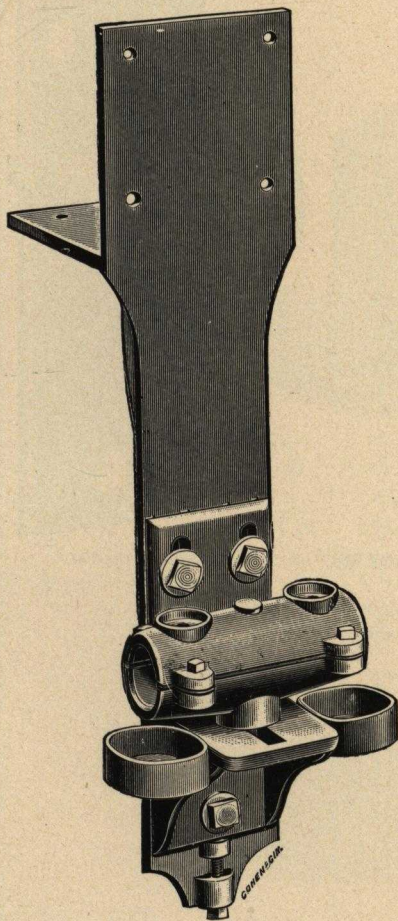


Shaft.	Price.
$1\frac{1}{8}$	\$ 5 15
$1\frac{5}{8}$	6 05
$2\frac{3}{8}$	7 22
$2\frac{7}{8}$	9 15
$2\frac{1}{2}$	11 10
$2\frac{5}{8}$	12 95
$3\frac{3}{8}$	15 70
$3\frac{7}{8}$	20 25
$3\frac{1}{2}$	26 30
$3\frac{5}{8}$	31 10



GIRDER HANGERS.

WITH ADJUSTABLE BOX.



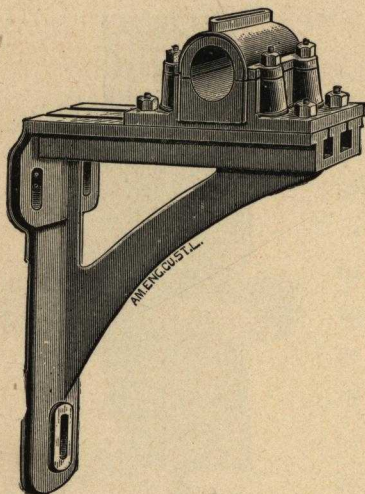
Shaft.	Price.
$1\frac{1}{8}$	\$15 15
$1\frac{5}{8}$	16 05
$2\frac{3}{8}$	17 22
$2\frac{7}{8}$	19 15
$2\frac{1}{2}$	21 10
$2\frac{5}{8}$	22 95
$3\frac{3}{8}$	25 70
$3\frac{7}{8}$	30 25
$3\frac{1}{2}$	36 30
$3\frac{5}{8}$	41 10

The Drop is from bottom of Girder to center of shaft. We make these Hangers any drop from thirty inches down.

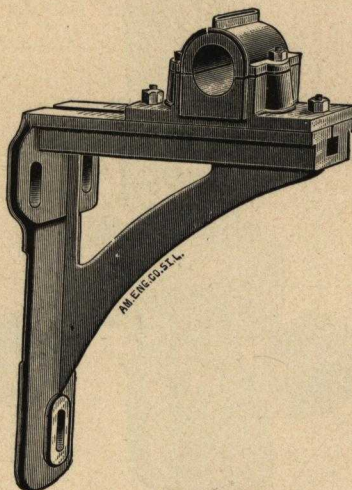
POST HANGERS.

PEDESTAL ON BRACKET.

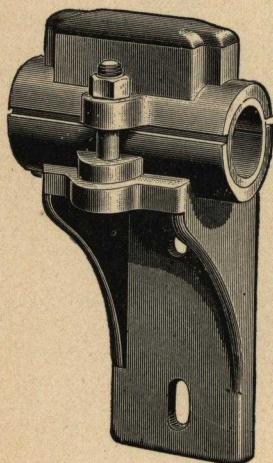
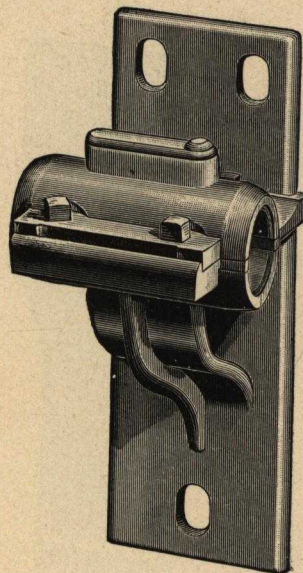
Price of Wall Bracket without Box, including Bolts for Box.



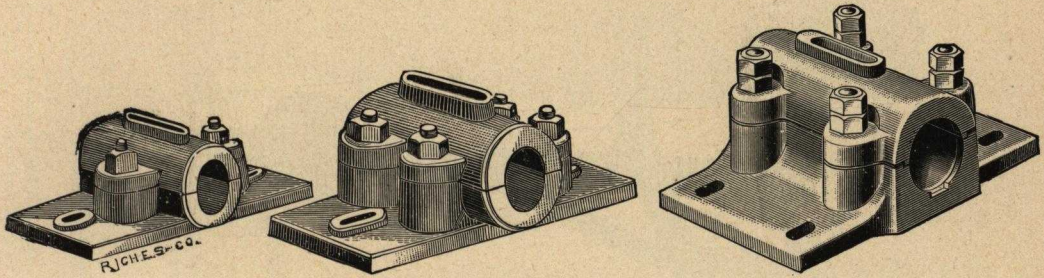
Shaft.	Price.
$1\frac{7}{8}$	\$ 4 00
$1\frac{1}{2}$	4 10
$1\frac{5}{8}$	4 40
$2\frac{3}{8}$	4 75
$2\frac{7}{8}$	5 40
$2\frac{1}{2}$	6 10
$2\frac{5}{8}$	7 00
$3\frac{3}{8}$	7 75
$3\frac{7}{8}$	8 60
$3\frac{1}{2}$	9 50
$3\frac{5}{8}$	10 50

**RIGID POST HANGERS.**

Diam. of Shaft.	Price.
$1\frac{3}{8}$	\$ 2 25
$1\frac{7}{8}$	2 60
$1\frac{1}{2}$	3 60
$1\frac{5}{8}$	4 65
$2\frac{3}{8}$	5 10
$2\frac{7}{8}$	6 20
$2\frac{1}{2}$	6 90
$2\frac{5}{8}$	8 50
$3\frac{3}{8}$	9 50
$3\frac{7}{8}$	10 75
$3\frac{1}{2}$	11 75
$3\frac{5}{8}$	13 00

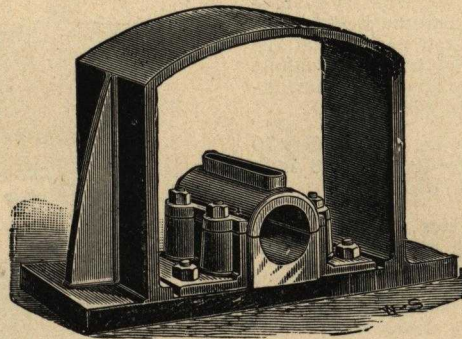
**BRACKET PILLOW BLOCKS.**

Diam. of Shaft.	Price.
$1\frac{3}{8}$	\$ 2 00
$1\frac{7}{8}$	2 40
$1\frac{1}{2}$	3 10
$1\frac{5}{8}$	4 00
$2\frac{3}{8}$	4 50
$2\frac{7}{8}$	5 60
$2\frac{1}{2}$	6 50
$2\frac{5}{8}$	7 50
$3\frac{3}{8}$	8 75
$3\frac{7}{8}$	10 50
$3\frac{1}{2}$	11 80
$3\frac{5}{8}$	14 00


FLAT JOURNAL BOXES.

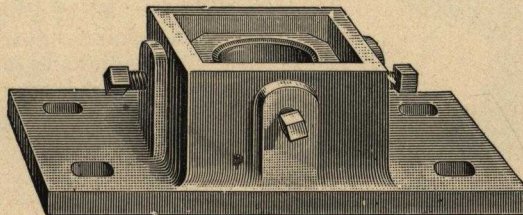
Diameter.....	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$2\frac{3}{8}$	$2\frac{7}{8}$
Length of Box.....	$3\frac{3}{4}$	$3\frac{1}{2}$	$\frac{4}{4}$	$\frac{6}{6}$	$\frac{7}{7}$	$7\frac{3}{4}$	$8\frac{3}{4}$
Price per Box.....	\$1 50	\$1 78	\$2 10	\$2 60	\$3 15	\$3 85	\$4 55

Diameter.....	$2\frac{1}{8}$	$2\frac{5}{8}$	$3\frac{3}{8}$	$3\frac{7}{8}$	$3\frac{1}{2}$	$3\frac{5}{8}$	$4\frac{7}{8}$
Length of Box.....	9	9	$9\frac{1}{4}$	$10\frac{1}{2}$	$11\frac{1}{4}$	12	$13\frac{1}{2}$
Price per Box.....	\$5 65	\$6 45	\$7 60	\$8 80	\$9 20	\$11 60	\$14 25

WALL FRAMES.


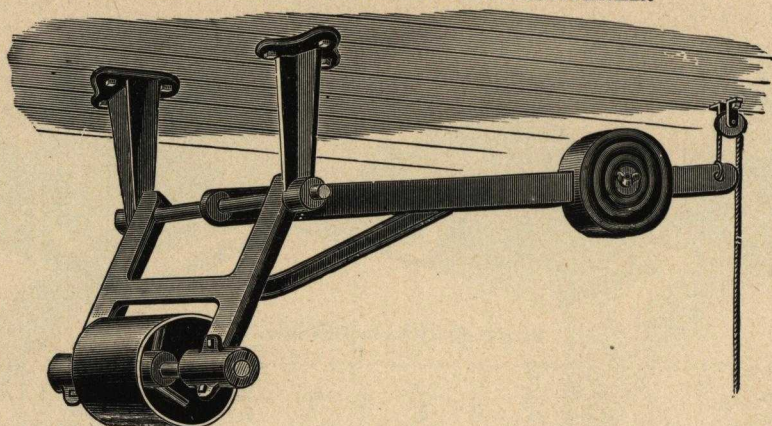
Diameter of Shaft,	$1\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$2\frac{3}{8}$	$2\frac{7}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$
Price,	\$4 40	\$5 75	\$5 75	\$7 50	\$7 50	\$12 00	\$12 00
Diameter of Shaft,	$3\frac{3}{8}$	$3\frac{7}{8}$	$3\frac{1}{2}$	$3\frac{5}{8}$	$4\frac{3}{8}$	$4\frac{7}{8}$	$4\frac{1}{2}$
Price,	\$15 00	\$15 00	\$17 50	\$17 50	\$20 50	\$20 50	\$26 00

Journal Boxes are not included in above prices. For prices of Journal Boxes see price list above.

ADJUSTABLE STEP BOX.


Diameter of Shaft,	$1\frac{3}{8}$	$1\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{7}{8}$	$2\frac{1}{2}$
Price,	\$5 00	\$5 40	\$6 50	\$7 80	\$9 00	\$10 60	\$14 25

IMPROVED ADJUSTABLE BELT TIGHTENER.



Number,	1	2	3	4	5	6
Width of belt, inches,	4	5 to 6	8	10 to 12	14 to 18	20 to 24
Diameter of pulley, inches,	8	10	12	14	16	20
Price,	\$9.00	\$12.50	\$16.50	\$25.00	\$35.00	\$50.00

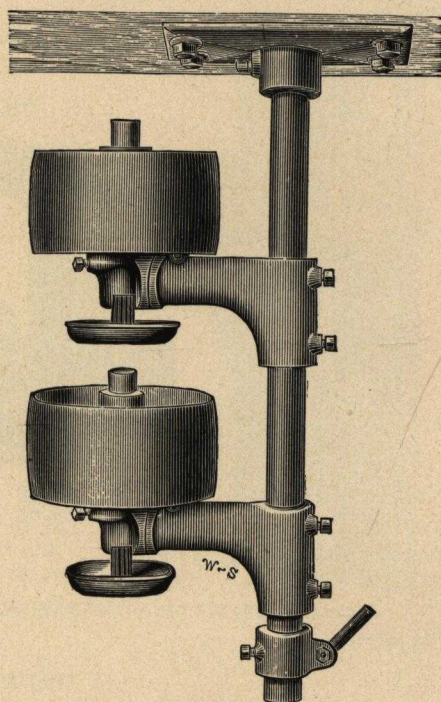
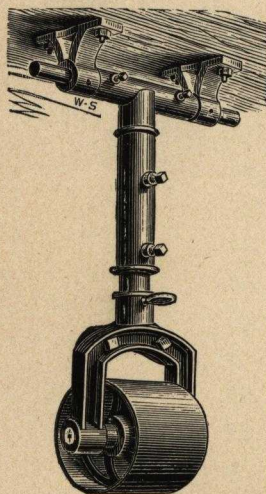
BELT TIGHTENER.

This cut represents a Superior Belt Tightener; it can be placed above or below the floor and adjusted to accommodate the belt in any desired position on the pulley face, and can be lengthened or shortened at will.

Price, with pulley 10 inch diameter, 8 inch face, \$15.00.

Price, with pulley 10 inch diameter, 12 inch face, \$18.00.

Price, with pulley 10 inch diameter, 16 inch face, \$21.00.



MULE PULLEY STAND.

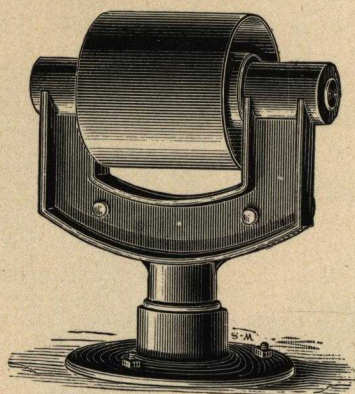
FOR CARRYING POWER AROUND A CORNER.

Adjustable in every direction.

The line shafts may be at any angle with each other, need not be in the same plane, the pulleys may differ much in diameter and the belts may be crossed.

Locate the Stand so that its shaft will be about ten times the width of the belt from the line shaft.

Price No. 1, from 3 to 5 inch belt, \$50.00
 " " 2, " 6 to 8 " " 60.00
 " " 3, " 10 to 12 " " 75.00



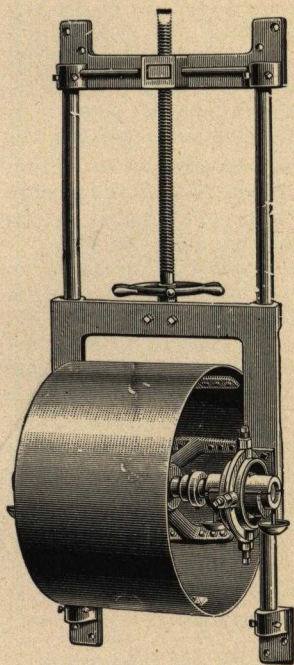
GUIDE PULLEY STAND.

ADJUSTABLE IN EVERY DIRECTION.

Price, No. 1, from 3 to 5 inch belt, \$10.00
 " " 2, " 6 to 8 " " 12.00
 " " 3, " 10 to 12 " " 15.00

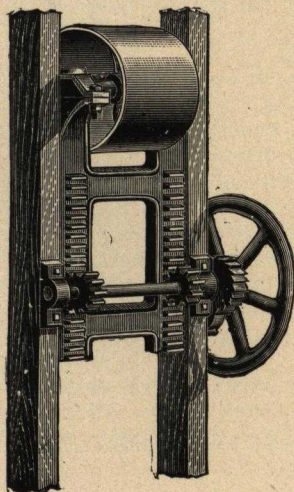
IRON FRAME BELT TIGHTENER.

Adjustable.—Complete with Double-Belt Pulley and Self-Oiling Babbitted Bearings.



These tighteners are very simply and substantially constructed and are positive in action. They are supplied with self-oiling adjustable bearings, and are capable of the very nicest adjustment, as by using the adjusting screws which hold the boxes, the belt can be made to run exactly in the center of the pulley. These tighteners are in every way superior to the old style Rack and Pinion tightener. We have sold them for years, and they have given perfect satisfaction; we cannot recommend them too highly.

Number.	Length of Adjustm't	Dist. betw. Uprights.	PULLEY. Diam. Face.	PRICE.
1	20 inches.	14 inches.	12 x 9	\$ 47 00
2	22 "	14 "	14 x 11	51 50
3	24 "	18 "	18 x 13	62 00
4	26 "	18 "	20 x 17	72 50
5	30 "	24 "	24 x 21	98 00
6	34 "	27 "	30 x 25	129 00
7	40 "	34 "	36 x 31	167 50
8	46 "	40 "	40 x 37	237 50

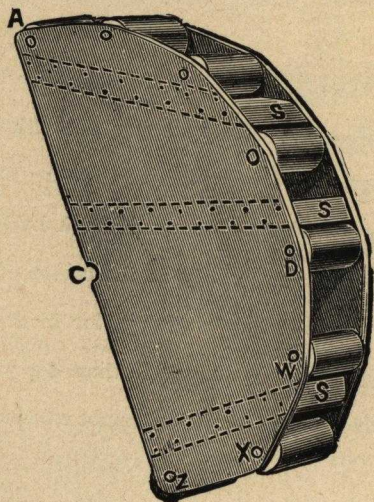
UNIVERSAL BELT TIGHTENER.

This cut plainly illustrates a Belt Tightener that can be used in any position whatever, the tension being regulated by the hand wheel and ratchet working through pinion and rack, moving the pulley to or from the belt as occasion requires.

Number.	Amount of Adjustment.	Pulley. Diam. Face.	Diameter of Shaft.	Price.
1	18 inches.	12 x 9	1 $\frac{1}{8}$	\$ 47 00
2	20 "	12 x 12	1 $\frac{1}{8}$	51 50
3	24 "	18 x 14	1 $\frac{5}{8}$	62 00
4	30 "	20 x 16	2 $\frac{3}{16}$	72 50
5	48 "	24 x 20	2 $\frac{7}{16}$	98 00
6	60 "	30 x 26	2 $\frac{1}{8}$	129 00

WELLINGTON BELT HOLDER.

DESCRIPTION.



The Wellington Belt Holder is a series of rollers turning on iron axle bolts, supported at their ends in a strong frame and placed in a curved line so that all of them from A to X shall be level with the face of the pulley on the line shaft, beside which it is placed, so that the belt can be easily thrown from the pulley on to the Holder, or from it back to the pulley at will, by the hand or a stick or some of the shifting contrivances in common use. It is supported parallel with and close to its pulley by the braces, B B and does not touch the pulley or the shaft. It is firmly bolted to the braces, the bolts passing through both the sides and the stays S. S.

The roller Z is placed inside the pulley circle so that when the belt is on the Holder it is strained less than when on the pulley. It can be used in any position, care being taken to place it beside the pulley so that the roller A shall be at the point on the pulley where the belt first touches it when running upon it, and the rollers from A to X level with the face of the pulley.

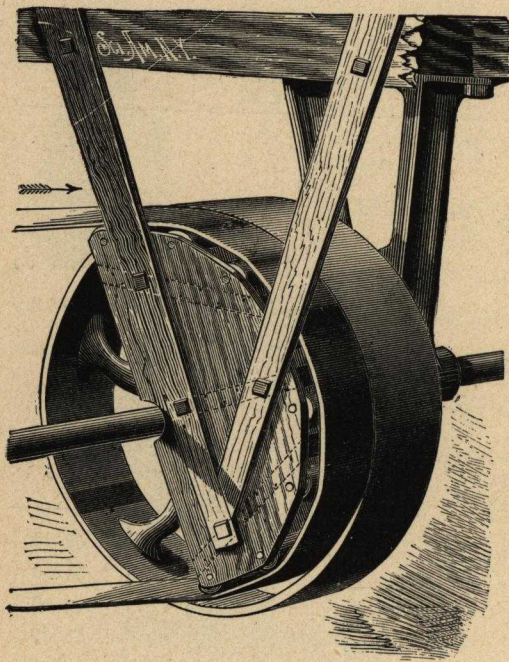
ADVANTAGES.

IT SAVES MONEY.—We can furnish them at less cost than that of the extra width of driving pulley and of loose pulleys.

IT SAVES BELTS.—Many machines can only run part of the time, but belts wear nearly as fast running over loose pulleys as when driving the machine. Why not stop this waste by letting the belt lie still?

IT DISPENSES WITH LOOSE PULLEYS.—Many a man has said to us "well if it will do that I want it," and no wonder, as those very well know, who for years have experienced the bushing, heating and constant clatter of these supposed necessary evils. The Wellington Belt Holder will do it. You need only a single pulley on your machine, and single width of pulley on your line shaft. The belt does not leave the small pulley on machine when thrown from driving pulley on line shaft to the Holder.

IT SAVES TIME.—Since the belt can be easily and quickly thrown on or off and the machine stopped or started in an instant without stopping the engine.



WELLINGTON BELT HOLDER,—Continued.

IT IS SAFE.—The practice of throwing off and putting on belts while in motion, with little or nothing to catch and hold them, is dangerous as many have found to their sorrow. The Wellington Belt Holder will keep the belt in nearly the same position as when at work, and enable you to shift it safely, and when the machine is not running the belt lies still and avoids the danger of operators and other persons being caught by running belts.

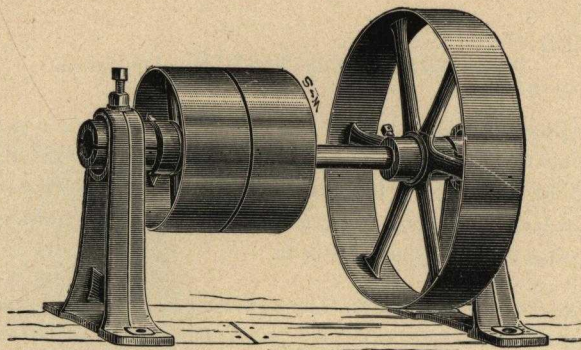
IT RELIEVES THE TENSION OF BELTS.—The end being cut off makes the distance around the Holder less than the distance around the driving pulley, therefore when the belt is on the Holder it lies loosely. This also enables you to lace belts at any time, which you cannot do when they run over loose pulleys, and also much better than if the belt was still but stretched over a dead pulley of equal diameter with the driving pulley.

IT SAVES BABBITING BOXES.—The belt lying stock still when not in use and the Holder being sustained by braces that do not touch the shaft, there is no strain whatever on the shaft and its bearings.

IT SAVES OIL AND WEARS WELL.—The rollers have long bearings, and run only an instant while shifting the belt, so they seldom need oiling, and it wears so little it will last a lifetime.

PRICE LIST WELLINGTON BELT HOLDER.

Diameter of Pulley.	WIDTH OF BELT.							
	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	10 in.	12 in.
Up to 16	\$ 4 50	\$ 4 75	\$ 5 00	\$ 5 25	\$ 5 50	\$ 5 75		
17 & 18	4 75	5 00	5 25	5 50	5 75	6 00		
19 & 20	5 05	5 30	5 55	5 80	6 05	6 30	\$ 7 55	
21 & 22	5 40	5 65	5 90	6 15	6 40	6 65	7 90	
23 & 24	5 80	6 10	6 40	6 70	7 00	7 30	8 80	\$10 60
25 & 26	6 25	6 55	6 85	7 15	7 45	7 75	9 25	11 05
27 & 28	6 75	7 05	7 35	7 65	7 95	8 25	9 75	11 55
29 & 30	7 30	7 60	7 90	8 20	8 50	8 80	10 30	12 10
31 & 32	7 90	8 25	8 60	8 95	9 30	9 65	11 40	13 50
33 & 34	8 55	8 90	9 25	9 60	9 95	10 30	12 05	14 15
35 & 36	9 25	9 60	9 95	10 30	10 65	11 00	12 75	14 85
37 & 38		10 35	10 70	11 05	11 40	11 75	13 50	15 60
39 & 40		11 20	11 60	12 00	12 40	12 80	14 80	17 20
41 & 42		12 05	12 45	12 85	13 25	13 65	15 65	18 05
43 & 44		12 95	13 35	13 75	14 15	14 55	16 55	18 95
45 & 46		13 90	14 30	14 70	15 10	15 50	17 50	19 90
47 & 48		14 95	15 40	15 85	16 30	16 75	19 00	21 70
49 & 50			16 45	16 90	17 35	17 80	20 05	22 75
51 & 52			17 55	18 00	18 45	18 90	21 15	23 85
53 & 54			18 70	19 15	19 60	20 05	22 30	25 00
55 & 56			20 00	20 50	21 00	21 50	24 00	27 00
57 & 58			21 25	21 75	22 25	22 75	25 25	28 25
59 & 60			22 55	23 05	23 55	24 05	26 55	29 55

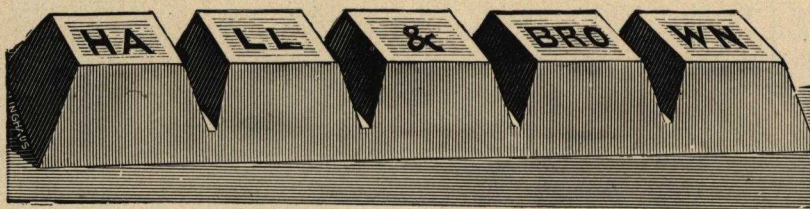


SUPERIOR COUNTER-SHAFTING.

The following list of Counter-shafts comprises some ten sizes which are more or less in demand for various purposes and which can be furnished on short notice. The shafts are turned and polished, the pulleys bored, turned, set-screwed and balanced. The hangers are of substantial form with babbitted bearings—reversible for over head or on the floor.

Number.	Diameter of Shaft. Inches.	Length of Shaft. Feet.	Size of Driving Pulley.	Size of Fast and Loose Pulley.	List Price Including Reversible Hangers.
1	2 3-16	6	36x12 $\frac{1}{2}$	14x12 $\frac{1}{2}$	\$55 00
2	2 3-16	5	36x10 $\frac{1}{2}$	14x10 $\frac{1}{2}$	49 00
3	1 15-16	4 $\frac{1}{2}$	30x 6 $\frac{1}{2}$	12x 8 $\frac{1}{2}$	35 00
4	1 15-16	4 $\frac{1}{2}$	28x 6 $\frac{1}{2}$	12x 6 $\frac{1}{2}$	30 00
5	1 11-16	4	26x 6 $\frac{1}{2}$	10x 6 $\frac{1}{2}$	27 00
6	1 11-16	4	24x 6 $\frac{1}{2}$	10x 6 $\frac{1}{2}$	25 00
7	1 7-16	3 $\frac{1}{2}$	20x 5 $\frac{1}{2}$	10x 5 $\frac{1}{2}$	22 00
8	1 7-16	3	20x 4 $\frac{1}{2}$	10x 4 $\frac{1}{2}$	20 00
9	1 $\frac{1}{2}$	2 $\frac{1}{2}$	18x 4 $\frac{1}{2}$	8x 4 $\frac{1}{2}$	17 00
10	1 $\frac{1}{2}$	2	16x 3 $\frac{1}{2}$	8x 3 $\frac{1}{2}$	14 00

The above dimensions may be varied a little to suit customers when made to order.



GENUINE BABBITT METAL.

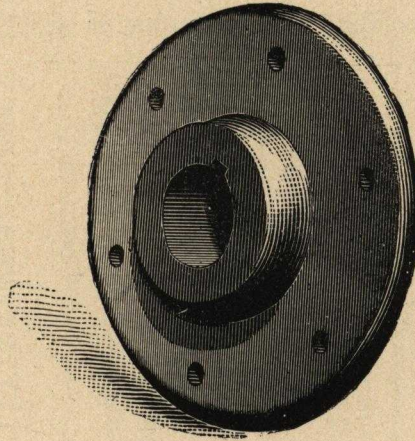
Babbitt Metal for Wood-Working Machinery running at a high speed should have a special prepared alloy for the Journal Bearings. It should not only have the right degree of hardness, but it also should be of such a combination of metals that wears well and preserves the Journals.

Most of the so-called Babbitt metal which floods the market, is nothing but a cheap combination of poor and inferior metal, not fit for Wood-working Machinery. We manufacture a special alloy for lining Journal Boxes which we guarantee to give satisfaction.

Genuine Special, per pound,	\$.35
No. 1,	.25
" 2,	.15

PULLEY FLANGES.

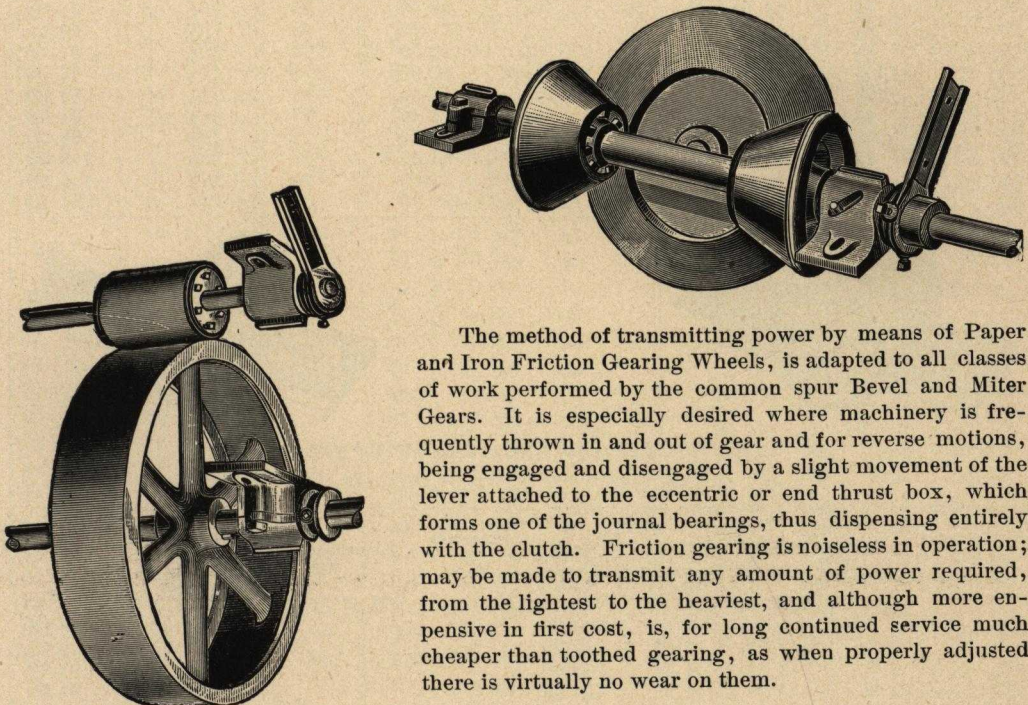
BORED, SET-SCREWED OR KEY-SEATED.



Diameter,	4	6	8	10	12	14	16	18	20	24
Price each,	\$1 50	\$2 00	\$2 50	\$3 00	\$3 75	\$4 50	\$5 50	\$6 25	\$7 00	\$8 50

FRICTION PAPER FOR PULLEYS.Size 33x46x $\frac{1}{4}$ inches, 75 cents per sheet.

Weight 10 pounds to a sheet.

FRICTION GEARING A SPECIALTY.

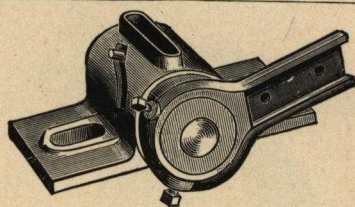
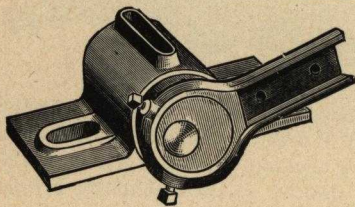
The method of transmitting power by means of Paper and Iron Friction Gearing Wheels, is adapted to all classes of work performed by the common spur Bevel and Miter Gears. It is especially desired where machinery is frequently thrown in and out of gear and for reverse motions, being engaged and disengaged by a slight movement of the lever attached to the eccentric or end thrust box, which forms one of the journal bearings, thus dispensing entirely with the clutch. Friction gearing is noiseless in operation; may be made to transmit any amount of power required, from the lightest to the heaviest, and although more expensive in first cost, is, for long continued service much cheaper than toothed gearing, as when properly adjusted there is virtually no wear on them.

Price lists see pages 326 and 327.

PRICE OF COMPRESSED PAPER FRICTION GEARING

SPUR AND BEVEL, TURNED, BORED AND KEY-SEATED.

Diameter. Inches.	Face Inches.	PRICE.	Diameter. Inches.	Face Inches.	PRICE.	Diameter. Inches.	Face Inches.	PRICE.
6	4½	\$ 6 75	12	9½	22 75	22	7½	35 50
6	5½	8 00	12	10½	25 00	22	8½	40 00
6	6½	8 75	12	12½	30 00	22	9½	44 00
6	7½	9 50	14	4½	15 00	22	10½	48 00
6	8½	10 25	14	5½	17 50	22	12½	57 00
6	9½	10 75	14	6½	20 00	22	14½	66 00
6	10½	11 25	14	7½	22 50	22	16½	75 00
7	4½	7 50	14	8½	25 00	22	18½	82 00
7	5½	8 75	14	9½	\$28 00	22	20½	91 00
7	6½	9 75	14	10½	31 00	24	6½	34 00
7	7½	10 75	14	12½	35 00	24	7½	38 00
7	8½	11 75	14	14½	40 00	24	8½	43 00
7	9½	12 75	16	4½	17 50	24	9½	48 00
7	10½	13 75	16	5½	20 00	24	10½	53 00
8	4½	8 50	16	6½	22 50	24	12½	62 00
8	5½	9 75	16	7½	25 00	24	14½	71 00
8	6½	11 00	16	8½	28 00	24	16½	\$ 80 00
8	7½	12 00	16	9½	31 00	24	18½	90 00
8	8½	13 00	16	10½	35 00	24	20½	100 00
8	9½	14 00	16	12½	40 00	24	22½	110 00
8	10½	15 00	16	14½	46 00	24	24½	120 00
9	4½	10 00	18	4½	20 00	26	6½	37 00
9	5½	12 00	18	5½	22 50	26	8½	47 00
9	6½	13 50	18	6½	25 00	26	10½	57 00
9	7½	15 00	18	7½	28 00	26	12½	67 00
9	8½	16 50	18	8½	31 00	26	14½	78 00
9	9½	17 75	18	9½	36 00	26	16½	89 00
9	10½	19 00	18	10½	41 00	26	18½	100 00
10	4½	11 00	18	12½	47 00	26	20½	111 00
10	5½	13 00	18	14½	54 00	26	22½	123 00
10	6½	14 50	18	16½	61 00	26	24½	133 00
10	7½	16 00	20	6½	28 00	28	6½	40 00
10	8½	17 50	20	7½	32 00	28	8½	50 00
10	9½	19 00	20	8½	36 00	28	10½	61 00
10	10½	21 00	20	9½	40 00	28	12½	72 00
10	12½	25 00	20	10½	44 00	28	14½	84 00
12	4½	12 50	20	12½	52 00	28	16½	95 00
12	5½	14 50	20	14½	60 00	28	18½	106 00
12	6½	16 50	20	16½	68 00	28	20½	118 00
12	7½	18 50	20	18½	76 00	28	22½	130 00
12	8½	20 00	22	6½	31 00	28	24½	142 00



ECCENTRIC AND END-THRUST BOXES.

FOR USE WITH FRICTION GEARING.

Diameter. of Shaft.	Length of Bear. ing.		PRICE.		Diameter. of Shaft.	Length of Bear. ing.		PRICE.	
			Eccentric Box.	End- Thrust Box.				Eccentric Box.	End- Thrust Box.
1 3/16	4	..	\$ 8 75	\$ 9 00	2 3/16	7	8	\$15 40	\$16 00
1 1/8	5	7	10 00	10 25	2 1/8	8	9	17 60	18 00
1 1/4	5	7	11 50	12 00	2 1/4	8	9	20 00	21 00
1 5/16	6	8	13 20	13 50	2 5/16	9	10	22 50	24 00

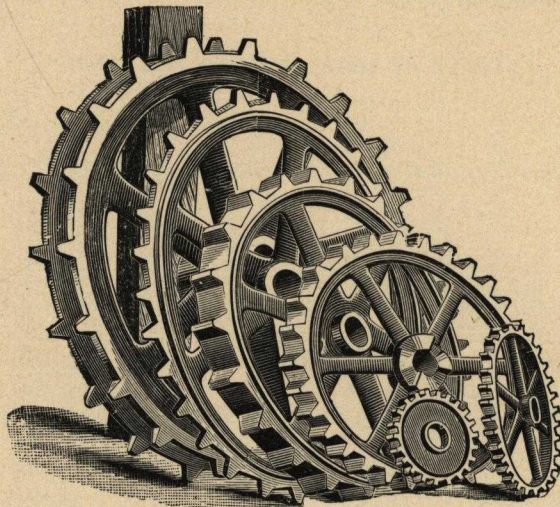
PRICE OF IRON FRICTION GEARING.

SPUR AND BEVEL, TURNED, BORED AND KEY-SEATED.

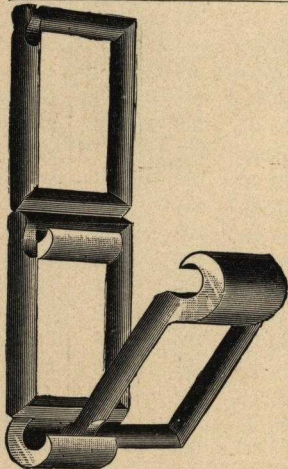
Diameter of Wheel, Inches.	Face of Wheel Inches	PRICE	Diameter of Wheel, Inches.	Face of Wheel Inches	PRICE	Diameter of Wheel, Inches.	Face of Wheel Inches	PRICE	Diameter of Wheel, Inches.	Face of Wheel Inches	PRICE
12	3	\$ 3 00	24	18	\$ 28 00	48	36	\$155 00	72	16	\$110 00
12	4	3 50	24	20	32 00	48	42	190 00	72	18	125 00
12	5	4 00	24	24	40 00	48	48	230 00	72	20	140 00
12	6	4 50	30	6	12 00	54	8	32 00	72	24	170 00
12	8	6 00	30	8	15 00	54	10	38 00	72	30	220 00
12	10	7 50	30	10	18 00	54	12	44 00	72	36	270 00
14	3	4 00	30	12	22 00	54	14	50 00	72	42	320 00
14	4	4 75	30	14	26 00	54	16	56 00	72	48	370 00
14	5	5 50	30	16	30 00	54	18	64 00	84	12	110 00
14	6	6 25	30	18	35 00	54	20	74 00	84	14	130 00
14	8	7 75	30	20	40 00	54	24	105 00	84	16	150 00
14	10	9 25	30	24	54 00	54	30	135 00	84	18	170 00
14	12	10 75	36	6	15 00	54	36	165 00	84	20	190 00
16	4	5 50	36	8	19 00	54	42	200 00	84	24	230 00
16	5	6 25	36	10	23 00	54	48	235 00	84	30	290 00
16	6	7 00	36	12	27 00	60	8	42 00	84	36	350 00
16	8	8 50	36	14	32 00	60	10	50 00	84	42	410 00
16	10	10 00	36	16	38 00	60	12	58 00	84	48	470 00
16	12	11 50	36	18	45 00	60	14	66 00	96	12	135 00
18	4	6 00	36	20	52 00	60	16	76 00	96	14	165 00
18	5	7 00	36	24	66 00	60	18	88 00	96	16	195 00
18	6	8 00	36	30	84 00	60	20	100 00	96	18	225 00
18	8	9 50	42	6	18 00	60	24	135 00	96	20	255 00
18	10	11 50	42	8	23 00	60	30	175 00	96	24	315 00
18	12	13 00	42	10	28 00	60	36	215 00	96	30	375 00
18	14	15 00	42	12	33 00	60	42	250 00	96	36	425 00
18	16	17 00	42	14	38 00	60	48	285 00	96	42	500 00
20	4	6 50	42	16	44 00	66	8	50 00	96	48	575 00
20	5	7 50	42	18	50 00	66	10	62 00	108	16	200 00
20	6	8 50	42	20	60 00	66	12	74 00	108	18	240 00
20	8	10 50	42	24	80 00	66	14	86 00	108	20	290 00
20	10	12 00	42	30	110 00	66	16	98 00	108	24	360 00
20	12	13 50	42	36	140 00	66	18	110 00	108	30	460 00
20	14	16 00	48	8	27 00	66	20	125 00	108	36	560 00
20	16	19 00	48	10	32 00	66	24	150 00	108	42	660 00
24	4	7 50	48	12	37 00	66	30	190 00	108	48	760 00
24	6	9 50	48	14	45 00	66	36	230 00	120	16	275 00
24	8	12 00	48	16	52 00	66	42	270 00	120	18	325 00
24	10	14 50	48	18	60 00	66	48	310 00	120	20	375 00
24	12	17 50	48	20	70 00	72	10	65 00	120	24	475 00
24	14	20 50	48	24	90 00	72	12	80 00	120	30	550 00
24	16	24 00	48	30	125 00	72	14	95 00	120	36	650 00

SPROCKET WHEELS.

BORED AND SET SCREWED OR KEY SEATED.



No. 25			No. 32			Nos. 35, 45, 55			No. 42			Nos. 55, 67, 77			Nos. 75, 78, 88		
Pitch Diam. Ins.	Teeth	Price.	Pitch Diam. Ins.	Teeth	Price.	Pitch Diam. Ins.	Teeth	Price.	Pitch Diam. Ins.	Teeth	Price.	Pitch Diam. Ins.	Teeth	Price.	Pitch Diam. Ins.	Teeth	Price.
2	7	80	2	5	\$0 80	2½	5	\$0 90	3	7	\$1 10	4½	5	\$1 35	5	6	\$1 65
2½	8	85	2½	6	85	3	6	1 00	3½	9	1 20	4½	6	1 45	6	7	1 80
3¼	11	1 00	2¾	7	90	3¾	7	1 10	4¾	11	1 35	5½	7	1 55	6½	8	2 00
3½	12	1 05	3	8	95	4¾	9	1 35	5¾	13	1 45	6	8	1 70	7½	9	2 20
4	14	1 10	3½	9	1 05	5¾	11	1 55	6¾	14	1 60	6¾	9	1 85	8¼	10	2 40
5	17	1 25	4¼	11	1 15	6	12	1 65	8	18	1 95	7½	10	2 00	9	11	2 60
6	21	1 45	4¾	13	1 25	7	13	1 75	8½	19	2 00	8	11	2 15	10	12	2 80
6½	22	1 50	6	16	1 45	8½	16	2 05	9½	22	2 25	8¾	12	2 30	10¾	13	3 00
7½	26	1 70	8¼	22	1 80	9½	18	2 25	10½	24	2 40	9½	13	2 50	11½	14	3 20
8	28	1 80	8½	23	1 95	10	19	2 35	11¾	27	2 70	11	15	2 85	12½	15	3 40
10	35	2 10	9	24	2 05	10½	20	2 45	14	32	3 20	11¾	16	3 05	14¼	17	3 90
12	42	2 40	9½	25	2 15	11½	22	2 70	15½	36	3 50	12¾	17	3 25	16	19	4 40
13¾	48	2 70	12	33	2 60	12	23	2 80	18	41	4 00	14	19	3 65	16½	20	4 65
15	52	2 90	14	38	2 90	12½	24	2 90	20	46	4 50	14¾	20	3 85	18½	22	5 15
16	56	3 10	16	44	3 30	13	25	3 00	24	55	5 75	15½	21	4 05	20	24	5 65
17½	60	3 30	16½	45	3 40	14¼	27	3 30				16½	22	4 25	21	25	5 90
18½	64	3 50				16	31	3 70				17	23	4 50	22½	27	6 40

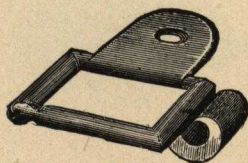


LINK BELTING.

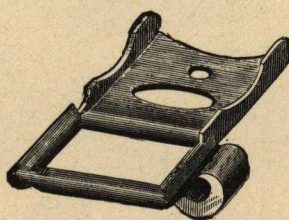
No.	PRICE PER FOOT.			Links Per Foot.	Working Strain.	Approxim'te in Leather Belting.
	All Plain Links.	All Attachm't Links.	With At- tachm't at Intervals.			
25	\$0 08	\$0 19	\$0 11	13.3	75 lbs.	1 in. single
32	08	17	11	10.4	150 "	1½ "
33	07	17	10	8.6	200 "	2 "
34	08	17	11	8.6	225 "	2½ "
35	08	15	11	7.4	250 "	2½ "
42	09	16	12	8.8	300 "	3 "
45	09	16	12	7.4	350 "	3½ "
51	11			10.4	375 "	4 "
52	12	17	13	8.	500 "	4 "
55	12	17	13	7.4	450 "	4 "
57	12	20	16	5.2	600 "	6 "
62	16	21	18	7.3	650 "	6½ "
66	16	21	18	6.	700 "	6½ "
67	16	21	18	5.2	700 "	7 "
75	18	22	19	4.6	750 "	7½ "
77	18	22	19	5.2	800 "	8 "
78	21	28	23	4.6	1000 "	10 "

The above prices of attachments are for A1, A2, A3, C1, E1, F2, G1, G6, H1, H2, K1, K2, M1, M3, R1, R3, S1 and S2, and as they are now made for the respective chains. Other attachments will be furnished at special prices.

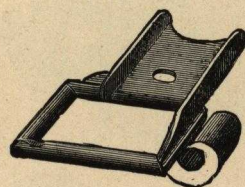
LINK BELTING ATTACHMENTS.



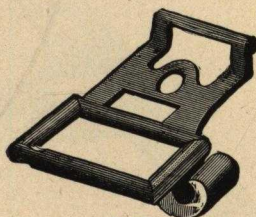
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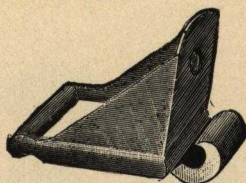
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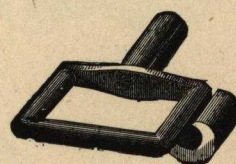
A 3.



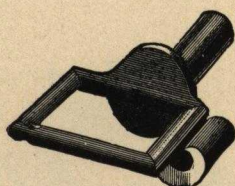
A 10.



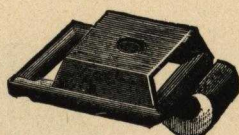
C 1.



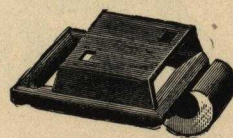
D 3.



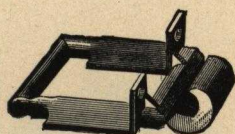
D 5.



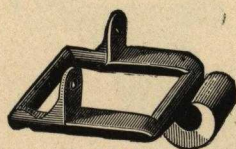
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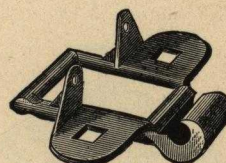
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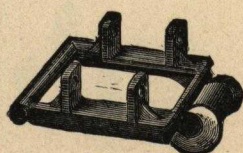
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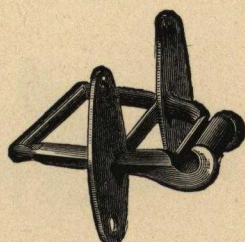
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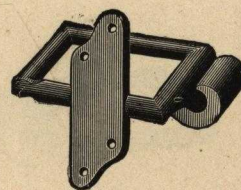
F 4.



F 5.

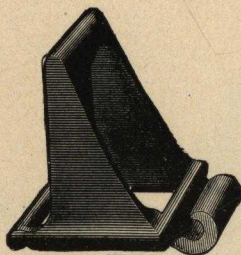


FF.

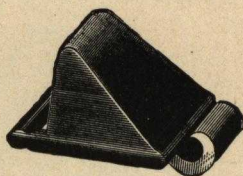


G 1.

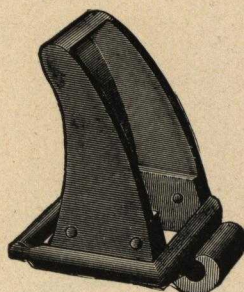
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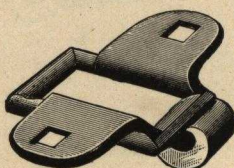
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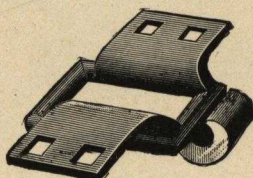
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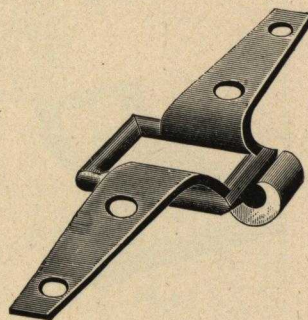
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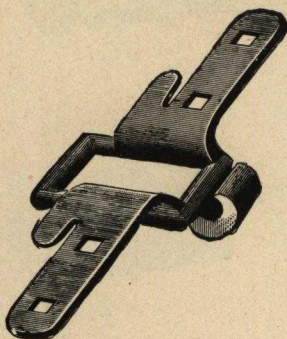
K L.



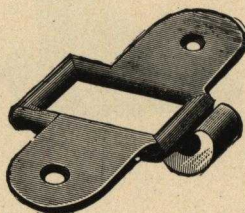
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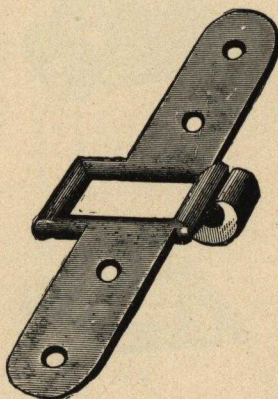
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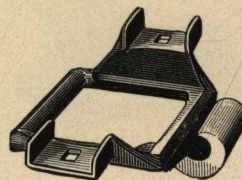
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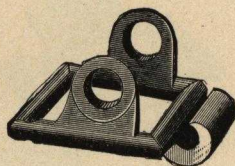
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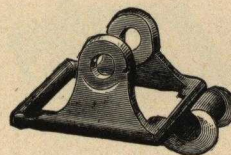
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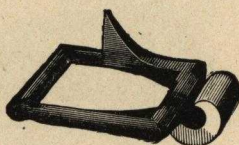
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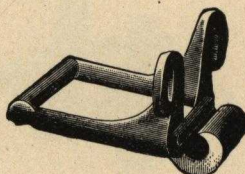
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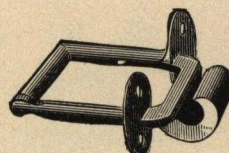
M 3.



R 1.

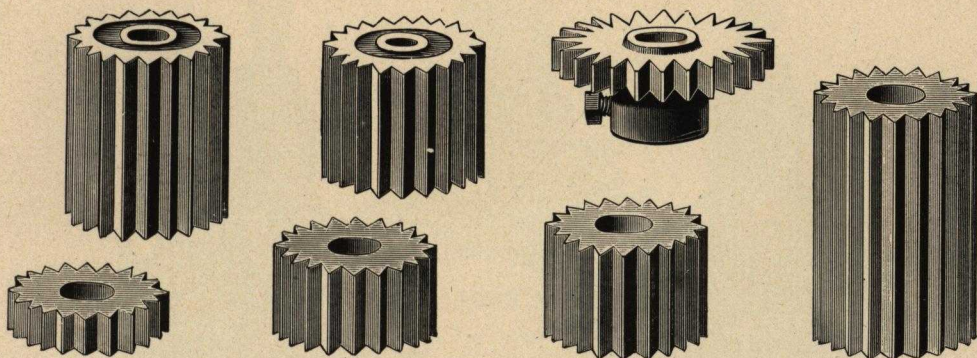


S 1.



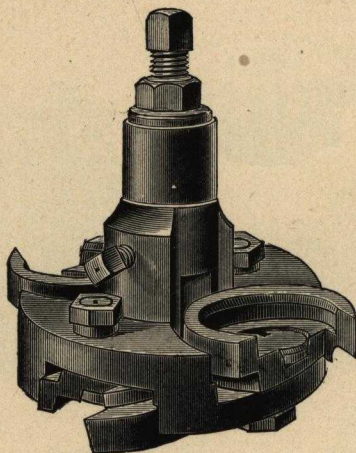
S 2.

MOULDER FEED ROLLS.

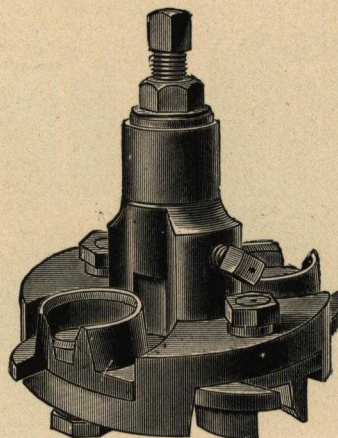


PRICE LIST.

Cast Iron, 4 inches diameter, 8 inches long, each.....					\$7 00
“ “ 4 “ “ 4 “ “ “ “.....					4 00
“ “ 4 “ “ 2 “ “ “ “.....					2 50
“ “ 4 “ “ 1 “ “ “ “.....					2 00
Steel, 4 “ “ 4 “ “ “ “.....					6 00
“ “ 4 “ “ 2 “ “ “ “.....					3 50
“ “ 4 “ “ 1 “ “ “ “.....					2 25
“ “ 4 “ “ 1 “ “ “ “.....					1 50
Cast Iron, 3 “ “ 3 “ “ “ “.....					3 00
“ “ 3 “ “ 2 1/2 “ “ “ “.....					2 50
“ “ 3 “ “ 2 “ “ “ “.....					2 00
“ “ 3 “ “ 1 1/2 “ “ “ “.....					1 75
“ “ 3 “ “ 1 “ “ “ “.....					1 50
Steel, 3 “ “ 3 “ “ “ “.....					4 00
“ “ 3 “ “ 2 1/2 “ “ “ “.....					3 50
“ “ 3 “ “ 2 “ “ “ “.....					3 00
“ “ 3 “ “ 1 1/2 “ “ “ “.....					2 75
“ “ 3 “ “ 1 1/4 “ “ “ “.....					2 50
“ “ 3 “ “ 1 “ “ “ “.....					2 25
“ “ 3 “ “ 3/4 “ “ “ “.....					2 00
“ “ 3 “ “ 1/2 “ “ “ “.....					1 75
“ “ 3 “ “ 3/8 “ “ “ “.....					1 50
“ “ 3 “ “ 1/4 “ “ “ “.....					1 50
“ “ 2 1/2 “ “ 2 1/2 “ “ “ “.....					3 00
“ “ 2 1/2 “ “ 2 “ “ “ “.....					2 75
“ “ 2 1/2 “ “ 1 3/4 “ “ “ “.....					2 75
“ “ 2 1/2 “ “ 1 1/2 “ “ “ “.....					2 50
“ “ 2 1/2 “ “ 1 1/4 “ “ “ “.....					2 25
“ “ 2 1/2 “ “ 1 “ “ “ “.....					2 00
“ “ 2 1/2 “ “ 3/4 “ “ “ “.....					1 75
“ “ 2 1/2 “ “ 1/2 “ “ “ “.....					1 50
“ “ 2 1/2 “ “ 1/4 “ “ “ “.....					1 25
“ “ 2 1/4 “ “ 2 1/4 “ “ “ “.....					2 75
“ “ 2 1/4 “ “ 2 “ “ “ “.....					2 50
“ “ 2 1/4 “ “ 1 3/4 “ “ “ “.....					2 25
“ “ 2 1/4 “ “ 1 1/2 “ “ “ “.....					2 00
“ “ 2 1/4 “ “ 1 1/4 “ “ “ “.....					2 00
“ “ 2 1/4 “ “ 1 “ “ “ “.....					1 50
“ “ 2 1/4 “ “ 3/4 “ “ “ “.....					1 50
“ “ 2 1/4 “ “ 1/2 “ “ “ “.....					1 00
“ “ 2 1/4 “ “ 1/4 “ “ “ “.....					1 00
“ “ 2 “ “ 2 1/2 “ “ “ “.....					2 50
“ “ 2 “ “ 2 1/4 “ “ “ “.....					2 50
“ “ 2 “ “ 2 “ “ “ “.....					2 00
“ “ 2 “ “ 1 3/4 “ “ “ “.....					2 00
“ “ 2 “ “ 1 1/2 “ “ “ “.....					2 00
“ “ 2 “ “ 1 1/4 “ “ “ “.....					1 75
“ “ 2 “ “ 1 “ “ “ “.....					1 50
“ “ 2 “ “ 3/4 “ “ “ “.....					1 00
“ “ 2 “ “ 1/2 “ “ “ “.....					1 00
“ “ 2 “ “ 1/4 “ “ “ “.....					75



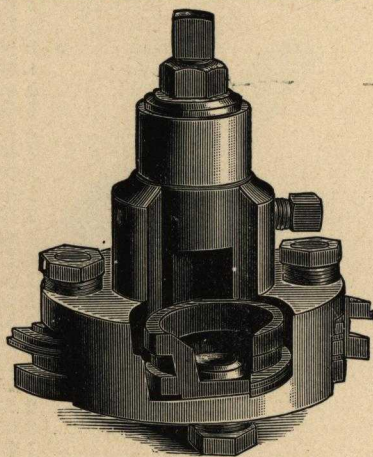
Tongue Head.



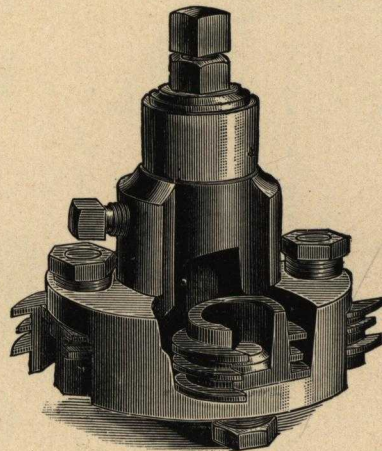
Groove Head.

SHIMER'S CIRCULAR BIT MATCHING HEADS.

Price, per set, complete with Bits,	-	-	-	\$38.00
New Bits for matching, 1 inch and upwards, per Set,	-	-	-	14.00
New Bits for matching, $\frac{1}{4}$ inch, Ceiling, per set,	-	-	-	12.00
Heads with Bits less than $2\frac{1}{4}$ inch circle, per Set,	-	-	-	36.00
New Bits, 2 and 2 1-8 inch circle, per Set,	-	-	-	12.00

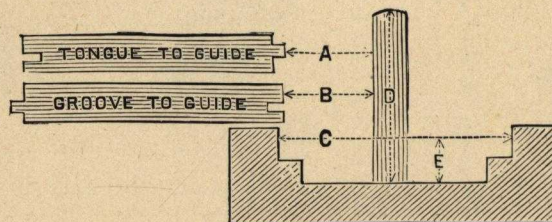


SHIMER HEADS
FOR
DOUBLE CEILING.

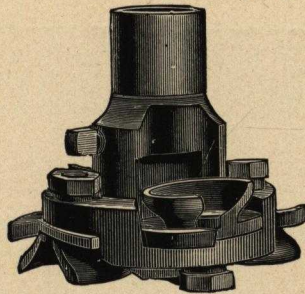


Price, per Set, with Bits complete,
Extra Bits, per Set,

\$38.00
14.00

**HOW TO ORDER.**

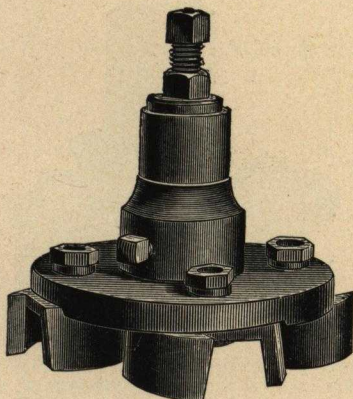
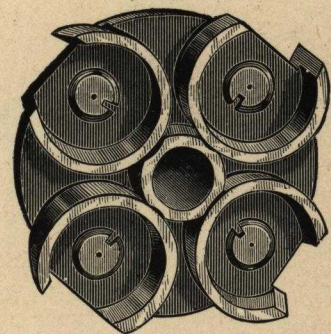
This cut represents the Spindle to the right as you stand feeding the machine. Send a wire the diameter of spindle; give height of spindle in inches, line D; depth box below level of bed, line E; free scope head has to turn in line C; Diameter of head in use (solid) across bottom. Can you move the fence or guide against which the board slides? Give length of line from spindle to jointed edge of board. Tongue or groove to guide, (see diagram). Give measure as above and we will guarantee a fit.


SHIMER'S OGEE DOOR AND SASH HEAD.

We represent by the above engraving our Door Ogee and Grooving Head, with all the late improvements as applied to the Matching Heads. The Grooving Cutters operate with side clearance, and the Ogee is turned into the outer circle of the Cutter, thus maintaining a uniformity of pattern. One set of Cutters will work from $1\frac{1}{4}$ to $1\frac{3}{4}$ with uniform Ogee and change of groove from 5-16 to $\frac{1}{2}$ inch wide. The alternate operation of the Cutters, their light and easy running, and the labor and material they save, are the special points of value.

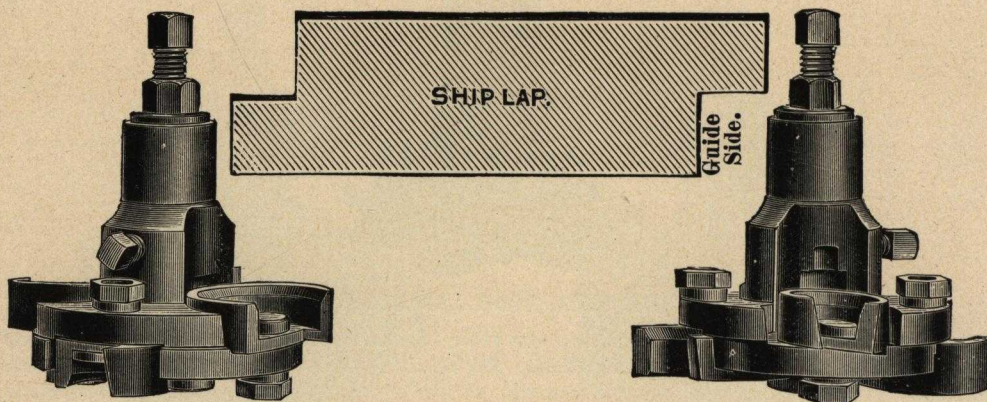
The Sash Head operates alike with clearance to the Cutters, but upon Tongue Head principle, while the Door Ogee Head works upon the Groove Head principle, therefore Sash and Door Cutters will not work upon the same Head.

Price, Ogee Door Head, complete wth Cutters, etc.,	\$20 00
New Cutters, per set, (4)	10 00
Cope Heads to match, each Head complete with Cutters,	10 00
New Cutters, per set, (2)	4 00
Price of Sash Head, complete with Cutters,	18 00
New Cutters, per set, 2 Rabbeting, \$3 00; 2 Moulding, \$5 00,	8 00
Cope Head to match,	10 00
New Cope Cutters, per set, (2)	4 00


JOINTER HEAD.
SHIMER'S
JOINTER HEAD.

JOINTER HEAD, bottom view.

The engraving herewith shows bottom and side view of a set of Heads for Jointing. They have each four bits in line of work starting the chip along the upper edge, making a draw cut.

Price, complete, with Bits to face $1\frac{1}{2}$ inch,	\$30 00
Price, complete, with Bits to face 2 inches,	32 00
Price, new Bits, per set (8), $1\frac{1}{2}$ inch face,	12 00
Price, new Bits, per set (8), 2 inch face:	14 00



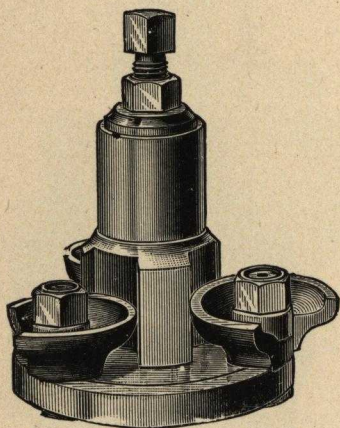
THE SHIMER HEADS FOR SHIP LAP.

Rabbeting the edge of a board or plank to make a Lap Joint half inch deep is heavy work, but the side clearance to the Bits that make the cut is complete, and the wear is all upon the cutting edge; therefore, no friction but a free and easy cut is the result.

Wainscoting on Ship Lap Heads requires two extra Bits for each Ship Lap Head to cut the upper edge of Board. These Bits should be fitted to the Heads, if wanted at all, when the heads are being made, as it requires special fitting of Heads to accommodate the Cutters.

Price, ship Lap Heads, complete.....	\$36 00
Price, new Bits, per set (8).....	12 00
Price, 4 Bits for Wainscoting.....	8 00
Price, Heads complete.....	38 00

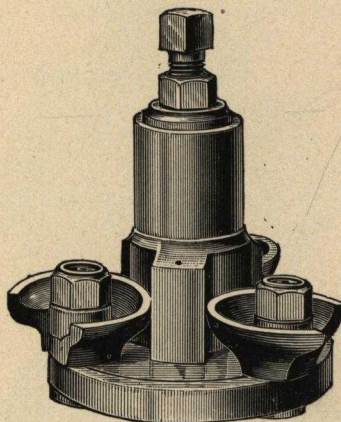
Bits for regular tongue and groove matching will not apply to these heads.



SHIMER HEADS

for

O. G. BATTEN.



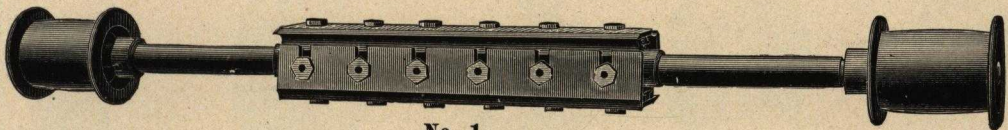
The regular Heads for O. G. Battens are made with three Bits in line of cut, secured by means of bolts having heads on under side of flange. The Bits are set in place by means of a gauge, that accompanies every set of Heads. The bolt head being a point central to the Bit serves in this instance, as a point to gauge from.

The bolts in connection with the O. G. Batten Heads, are revised to accommodate the Heads to the average depression in Matcher Plate, in which Head runs.

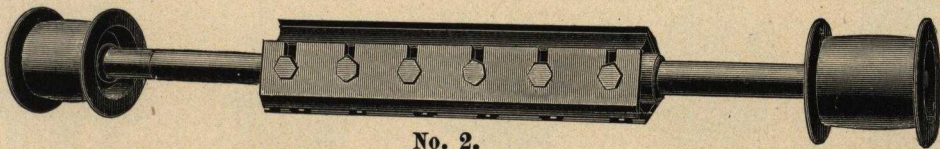
In ordering give Record Number of Matcher Heads you use on same machine. If, however, the Surface line of cut need not be exact then give the swing of cut that you prefer; that is, the circle the extreme point of Bit may describe and not interfere with any portion of the Machine around the Spindle. Always give the smallest diameter of cut after inner edge line of Cutters, and send pattern or drawing if you want special shape given to O. G.

Price, O. G. Batten Heads, complete.....	\$30 00
Price, new Bits, per set (6).....	12 00

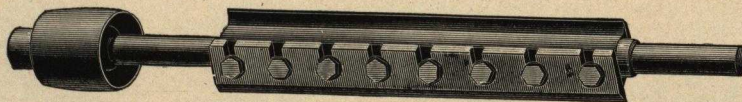
SOLID STEEL PLANER CYLINDER.



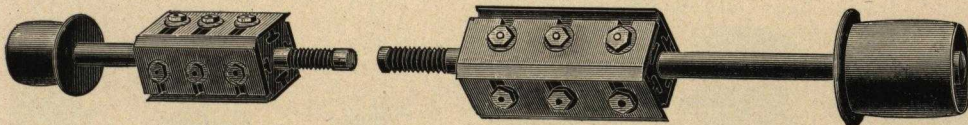
No. 1.



No. 2.



No. 3.



No. 5.

No. 4

Price, with Steel Bolts complete, with Pulleys and Knives.

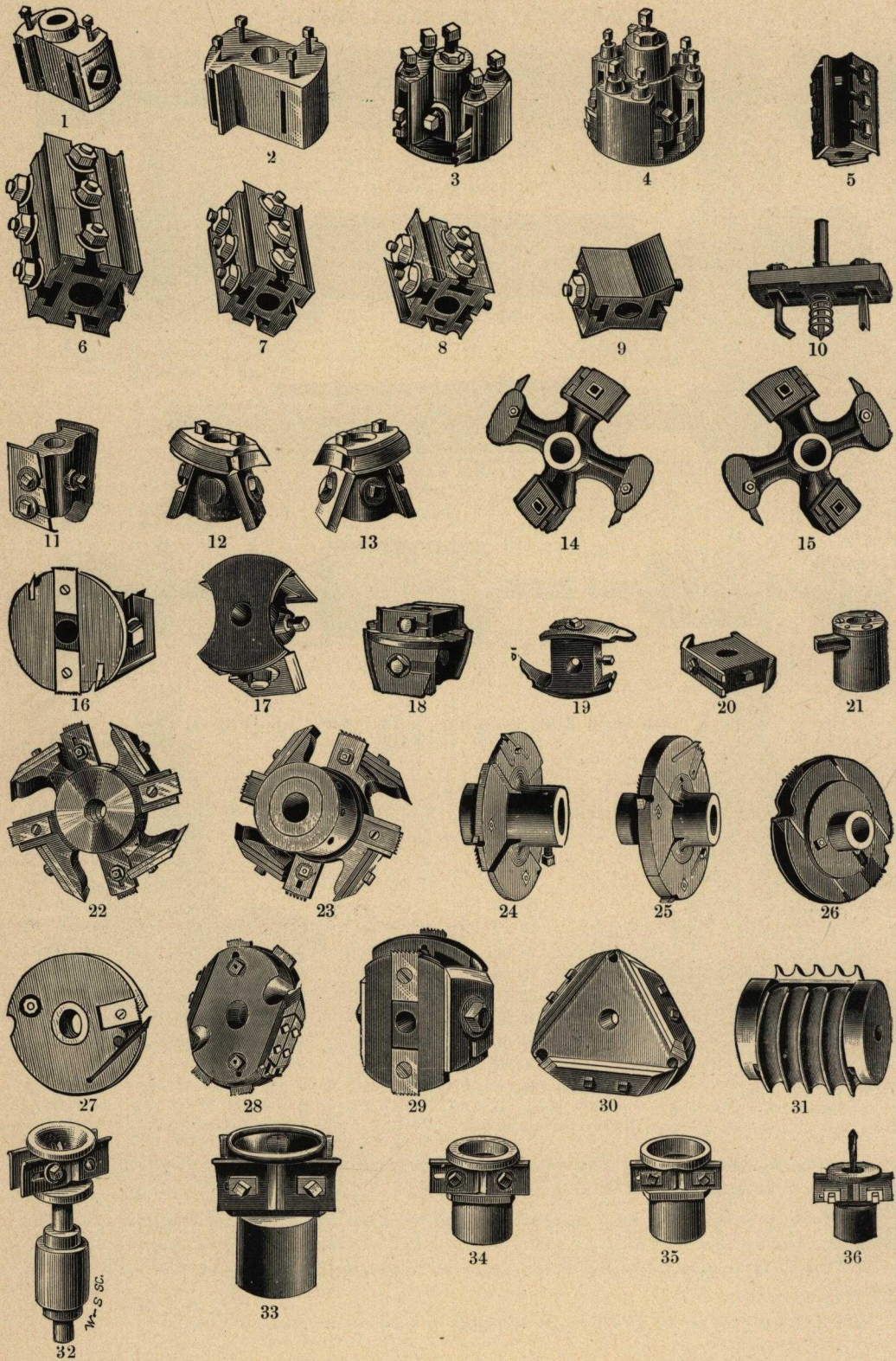
No. 1. 4 Sides, Slotted for 30 inch Knife, \$80 00	No. 3. 2 Sides, Solid for 26 inch Knife, \$60 00
" 1 4 " " 26 " 75 00	" 3 2 " " 24 " 55 00
" 1 4 " " 24 " 65 00	" 3 2 " " 20 " 50 00
" 1 4 " " 20 " 60 00	" 3 2 " " 18 " 45 00
" 1 4 " " 18 " 55 00	" 3 2 " " 16 " 40 00
" 1 4 " " 16 " 50 00	" 3 2 " " 14 " 35 00
" 1 4 " " 14 " 45 00	" 4 12 inch, 4 Slotted Head, Price, 25 00
" 2 3 Sides, Solid for 30 " 75 00	" 4 10 " 4 " " 23 00
" 2 3 " " 26 " 70 00	" 4 9 " 4 " " 20 00
" 2 3 " " 24 " 60 00	" 4 8 " 4 " " 18 00
" 2 3 " " 20 " 55 00	" 5 7 " 4 " " 16 00
" 2 3 " " 18 " 50 00	" 5 6 " 4 " " 15 00
" 2 3 " " 16 " 45 00	" 5 5 " 4 " " 14 00
" 2 3 " " 14 " 40 00	" 5 4 " 4 " " 12 00
" 3 2 " " 30 " 70 00	

Our Planer Cylinders are all made of Solid Steel Forgings, Head and Shaft forged in one piece, planed up and balanced without drilling..

In ordering, be careful to state plainly the length of Head for Knife, the length between the Shoulders, length and size of Shaft at both ends, whether top or bottom Head, the exact cutting circle of the Head, diameter and width face of pulleys, whether pulleys shall be with or without flanges.

Please observe the above directions in ordering, or send tracing of Head desired.

CUTTER HEADS.



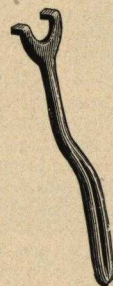
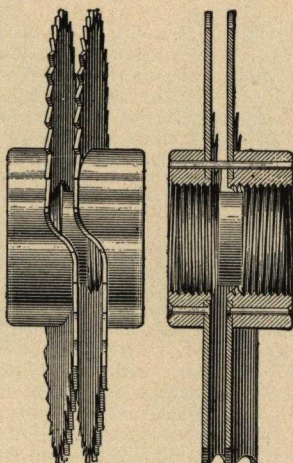
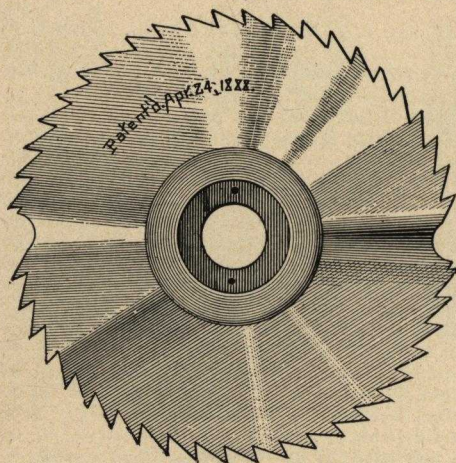
PRICE LIST OF CUTTER HEADS.

No. 1 Sash or Door Head, Capped.....	\$ 7 50
" 2 Sash or Door Mortise Head, without caps.....	6 50
" 3 Two Winged Steel Matcher Heads with one set Solid Milled Bits, per pair.....	22 00
" 3 Two Winged Gun Metal Matcher Heads with one set Solid Milled Bits, per pair.....	25 00
" 4 Three Winged Steel Matcher Heads with one set Solid Milled Bits, per pair.....	25 00
" 4 Three Winged Gun Metal Matcher Heads with one set Solid Milled Bits, per pair.....	28 00
" 5 Three Side Jointer Head, 4 inches long, with knives.....	7 00
" 5 Three Side Jointer Head, from 4 to 6 inches long, with knives.....	10 00
" 5 Three Side Jointer Head, from 6 to 8 inches long, with knives.....	12 00
" 5 Three Side Jointer Head, from 8 to 10 inches long, with knives.....	15 00
" 6 Twelve inch 4 Slotted Steel Head, with full set of Steel Bolts and 2 straight knives.....	22 00
" 6 Ten inch 4 Slotted Steel Head, with full set of Steel Bolts and 2 straight knives.....	20 00
" 6 Nine inch 4 Slotted Steel Head, with full set of Steel Bolts and 2 straight knives.....	18 00
" 6 Eight inch 4 Slotted Steel Head, with full set of Steel Bolts and 2 straight knives.....	17 00
" 7 Seven inch 4 Slotted Steel Head, with full set of Steel Bolts and 2 straight knives.....	16 00
" 7 Six inch 4 Slotted Steel Head, with full set of Steel Bolts and 2 knives.....	15 00
" 7 Five inch 4 Slotted Steel Head, with full set of Steel Bolts and 2 straight knives.....	14 00
" 8 Four inch 4 Slotted Steel Head, with full set of Steel Bolts and 2 straight knives.....	10 00
" 8 Three inch 4 Slotted Steel Head, with full set of Steel Bolts and 2 straight knives.....	8 00
" 8 Two inch 4 Slotted Steel Head, with Steel Bolts and 2 straight knives.....	7 00
" 9 Twelve inch 2 side Slotted Steel Head, Steel Bolts and straight knives.....	20 00
" 9 Ten inch 2 side Slotted Steel Head, Steel Bolts and straight knives.....	18 00
" 9 Nine inch 2 side Slotted Steel Head, Steel Bolts and straight knives.....	16 00
" 9 Eight inch 2 side Slotted Steel Head, Steel Bolts and straight knives.....	15 00
" 9 Seven inch 2 side Slotted Steel Head, Steel Bolts and straight knives.....	14 00
" 9 Six inch 2 side Slotted Steel Head, Steel Bolts and straight knives.....	13 00
" 9 Five inch 2 side Slotted Steel Head, Steel Bolts and straight knives.....	12 00
" 9 Four inch 2 side Slotted Steel Head, Steel Bolts and straight knives.....	8 00
" 10 Adjustable Circle Cutter, to cut from 2 to 6 inches.....	12 00
" 11 Panel Raiser Head, right hand, with adjustable cutters, either O G or Bevel.....	12 00
" 12 Panel Raiser Head, outside, with adjustable cutters, either O G or Bevel.....	12 00
" 13 Panel Raiser Head, inside, with adjustable cutters, either O G or Bevel.....	12 00
" 14 Panel Raiser Head, with cutters, right hand for Universal Wood Worker.....	12 00
" 15 Panel Raiser Head, with cutters, left hand for Universal Wood Worker.....	12 00
" 14 and 15 with Bridge and Fence for Wood Worker complete.....	30 00
" 16 Outside Tenoner Head and Cutters.....	12 00
" 17 Inside Tenoner Head and Cutters.....	10 00
" 18 Rabitting Head and Cutters.....	12 00
" 19 Cope Head with circle Bent Cutters.....	4 00
" 20 Cope Head with square Bent Cutters.....	4 00
" 21 Threading Head for Wood Screws.....	7 00
" 22 Steel or Gun Metal Gaining Head, with collars to cut three sizes.....	20 00
" 23 Adjustable Steel Gaining Head, to Gain from $\frac{3}{4}$ to $1\frac{1}{2}$ inches.....	25 00
" 23 Adjustable Steel Gaining Head, to Gain from 1 inch to 2 inches.....	28 00
" 24 Steel Expansion Gaining Head, to Gain from $\frac{1}{2}$ to 1 inch.....	22 00
" 25 Steel Expansion Gaining Head, to Gain from 1 inch to 2 inches.....	25 00
" 26 Steel Expansion Gaining Head, to Gain from $\frac{1}{2}$ to 1 inch, furnished with bits for 3 sizes.....	22 00
" 26 Steel Expansion Gaining Head, to Gain from 1 to 2 in., furnished with bits for 3 sizes.....	25 00
" 27 Solid Gaining Head, to Gain one size only, from $\frac{1}{4}$ to $\frac{3}{4}$ inches.....	12 00
" 28 Mitre Gaining Head, to Gain three inches and under.....	20 00
" 29 Gaining Head for to Gain one size only, four inches or under.....	15 00
" 30 Box Joint Trimming Head.....	15 00
" 31 Beading Head with Steel Collars and Adjustable Milled Circular Bits for 4 Beads.....	22 00
" 31 Beading Head with three Beads.....	20 00
" 31 Beading Head with two Beads.....	18 00
" 32 Dowel or Rod Machine Head, to cut one size only, from $\frac{1}{4}$ to $\frac{3}{8}$ inch.....	8 00
" 33 Rod or Roll Head, for cutting rods any one size, from 1 inch to 2 inches.....	9 00
" 34 Rod or Chair Stretcher Head.....	8 00
" 35 Shoulder or Chair Stretcher, Tenon Head.....	8 00
" 36 Shoulder Tenon Head, with Bit for Boring.....	8 00

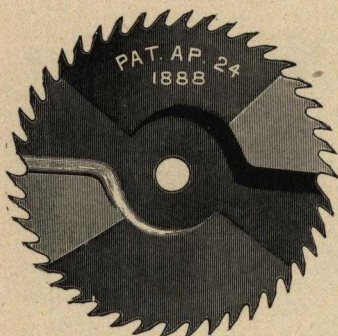
The cuts on opposite page show the styles of some of the Cutter Heads we manufacture. We are prepared to make to order any style of Head, suited to any class of work and to fit any machine. Sash, Door, Slotted Moulding Heads, Matching, Gaining, Grooving, etc. The Slotted Heads are made of steel. We usually keep a stock of the most common Heads in use on hand.

In ordering Heads, be careful to state plainly the length of Head, diameter of Cutting Circle, diameter of Shaft to fit, if Slotted, Capped or Plain; whether 2, 3 or 4 sided; if to be fastened with Set Screw or not. To insure a nice fit, take a Head that fits the machine and file a piece of wire to fit the hole, and send it to us.

THE LAMSON ADJUSTABLE CUTTER HEAD.

WRENCH
OR
KEY.

THIS GROOVE AND DADO HEAD is composed of two saw blades, as you will see by the engraving, and is adjusted by a screw to the hub, which is operated with a small fork-wrench or key, and can be set to any size required from given sizes. (See list.) This head will not get out of repair, as it is of the simplest construction.



SOLID CUTTER HEAD.

This head being made of one single blade, we can recommend it as being the best, cheapest and most practical of any cutter head now on the market.

Send for a set of our saws, or any one size; give them a trial.

We warrant our saws to do perfect work on any kind of stock without leaving rough or ragged edges. We also claim that we can do one-third more work in the same space of time, and with less power, than is necessary for any other head, as no time is lost in setting up our head.



SPECIAL DADO HEAD.

SPECIAL GROOVE AND DADO HEADS TO ORDER.

We also make any special size of head, with any number of grooves for special work, to order, and at lowest rates.

DIRECTIONS FOR KEEPING OUR SAWS IN ORDER.

1.—Saw or Cutter Head to be kept perfectly round. 2.—To be kept perfectly square on the butt. 3.—Teeth to be kept all of the same length. 4.—File the leading teeth sheering to the outside at an angle of 45 degrees on the flat surface only, all other teeth to be slightly sheering toward rest on saw bench.

REVISED SIZE AND PRICE LISTS.—Adjustable.

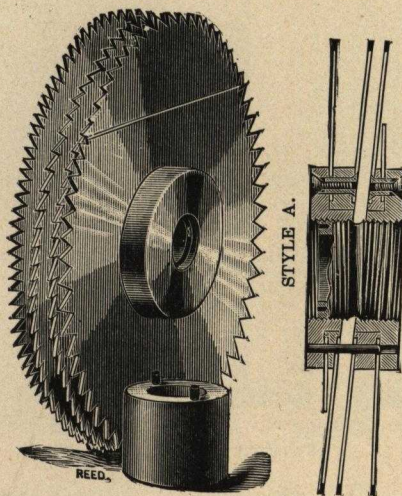
DIAMETER.		Adjust $\frac{1}{4}$ to $\frac{1}{2}$	Adjust $\frac{1}{2}$ to 1	Adjust 1 to $1\frac{1}{2}$
7 inches	Net.	\$ 8 40	\$ 9 10	\$11 90
8 "	"	9 10	9 80	12 60
9 "	"	9 80	10 50	13 30
10 "	"	10 50	11 20	14 00

SOLID OR NON-ADJUSTABLE.

DIAMETER.	Thickness $\frac{1}{4}$ & 5-16 in.	Thickness $\frac{3}{8}$ in.	Thickness $\frac{1}{2}$ in.	Thickness $\frac{3}{4}$ in.	Thickness $\frac{7}{8}$ in.
7 inches....Net.	\$2 60	\$3 00	\$3 30	\$3 85	\$4 75
8 " "	3 00	3 30	3 65	4 15	5 00
9 " "	3 30	3 65	4 00	4 50	5 40
10 " "	3 65	4 00	4 35	4 75	5 75

In ordering, be sure to give size of arbor.

UNIVERSAL DADO OR GROOVING SAW HEAD.



Both solid and adjustable, consisting entirely of saws.

This cut represents our adjustable Dado Head.

The adjustable head has four saws. One straight and wobble saw is firmly attached to each collar by the male and female screws. One collar has a right hand thread and the other a left hand thread. The screw or bushing has threads corresponding.

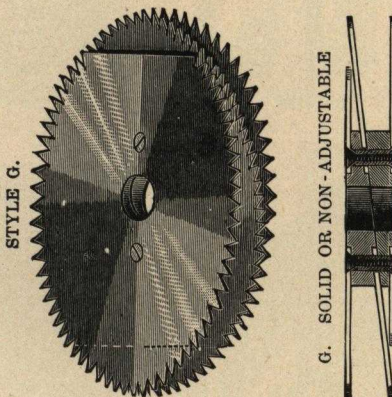
The adjustment is affected by inserting the pin wrench in the end of the bushing, which is broken in the cut to show the holes; turning it to the right for a wider cut; and to the left for a narrow cut; then when the chambered collar is replaced, and the saw arbor nut screwed up, it clamps the whole firmly together; the pin which is fast in one collar holding them in position. It will be observed that this can be done very quickly.

The two outside saws, which determine the width of cut, have seven times the cutting surface of any spur and knife dado head, and consequently will do vastly more work, retaining a uniform width of cut. The center saws remove the intervening stock and projecting over the outside saws admit of the saws being worn down from 1 to 3 inches.

Price List of Adjustable Heads.

Giving style and range of adjustment, also length of arbor required when head is open full cut. Our saws are two gauges thicker than the standard.

Style.....	A	A	A	A	A	A	A	A
Range.....	$\frac{3}{8}$ to $\frac{3}{4}$	$\frac{1}{2}$ to 1	$\frac{3}{4}$ to $1\frac{1}{4}$	$\frac{1}{2}$ to $1\frac{1}{2}$	$\frac{1}{2}$ to $1\frac{1}{4}$	1 to 2	$1\frac{1}{4}$ to $2\frac{1}{2}$	$1\frac{1}{2}$ to 3
Diameter, 8.....	\$24 00	\$23 00	\$23 00	\$23 00	\$24 00	\$24 00	.....	.....
10.....	.....	\$26 00	\$25 00	\$25 00	\$25 00	\$26 00	\$26 00	.....
12.....	.....	.....	\$30 00	\$28 00	\$28 00	\$28 00	\$30 00	\$30 00
14.....	.....	.....	.....	\$34 00	\$32 00	\$32 00	\$32 00	\$34 00
16.....	.....	.....	.....	.....	\$40 00	\$38 00	\$38 00	\$38 00
*Arbor length required.....	$1\frac{1}{2}$	$1\frac{1}{2}$	2	$2\frac{3}{8}$	$2\frac{1}{4}$	$3\frac{1}{8}$	$3\frac{3}{8}$	$4\frac{1}{8}$



This cut represents solid or non-adjustable head.

Where no adjustment is required we can recommend this saw as being unsurpassed for all kinds of dadoing, grooving and gaining.

As it embodies the oldest principles with the latest application. Cuts smooth and clean, does not tear out.

In ordering always give diameter, range, style and size of arbor.

*Length required on saw arbor, when saw is set for widest cut.

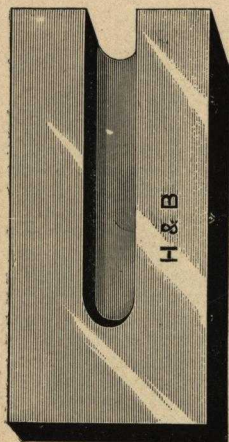
NUMBER OF REVOLUTIONS PER MINUTE.

Diameter, 8.....	4500	Diameter, 14.....	2585
Diameter, 10.....	3600	Diameter, 16.....	2222
Diameter, 12.....	3000		

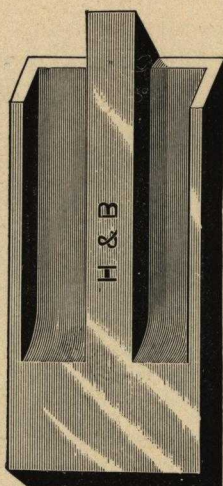
Price List of Plain or Non-Adjustable Saws.

Style	G	G	G	G
Will cut any one width.....	$\frac{5}{16}$ to 1	$\frac{3}{8}$ to $1\frac{1}{4}$	$\frac{1}{2}$ to $1\frac{1}{2}$	$\frac{3}{4}$ to $2\frac{1}{2}$
Diameter, 8.....	\$13 00	.....	.....	.....
10.....	.....	\$16 00	.....	.....
12.....	.....	.....	\$20 00	.....
16.....	.....	.....	.....	\$24 00

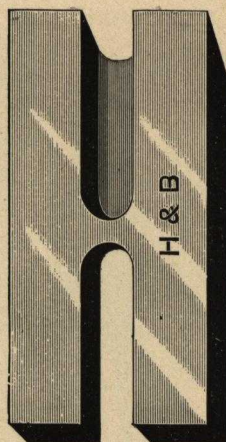
SOLID MILLED CUTTERS.
Matcher Cutters.



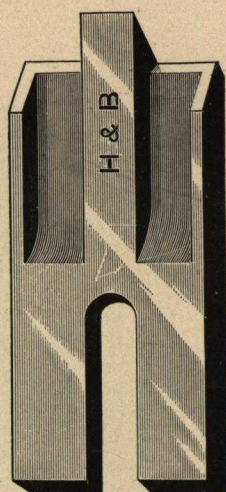
No. 13 Tongue.



No. 14 Groove.

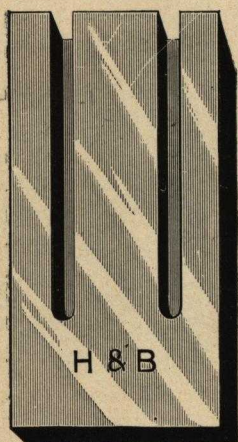


No. 15 Tongue.

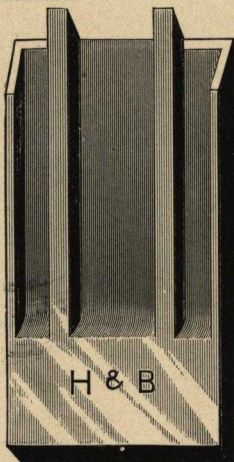


No. 16 Groove.

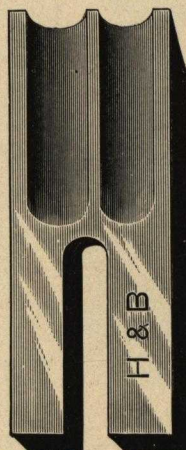
Beading Cutters.



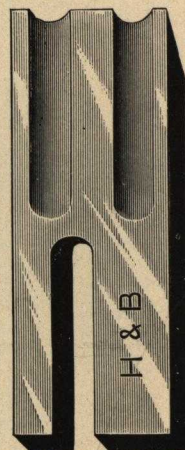
No. 17 Double Tongue.



No. 18 Double Groove.

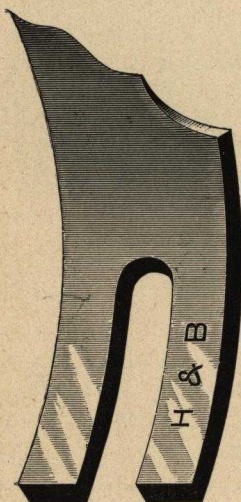


No. 19 Beading Cutter.

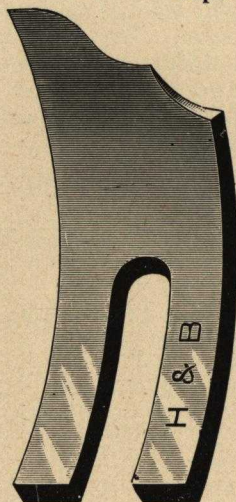


No. 20 Beading Cutter.

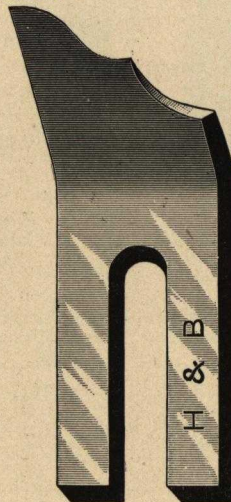
Cope Cutters.



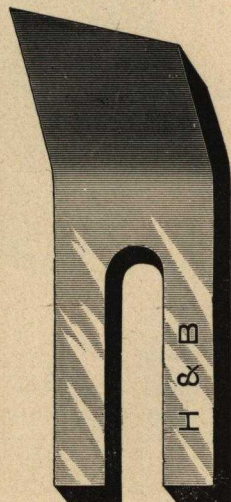
No. 21 Sash.



No. 22 Door.



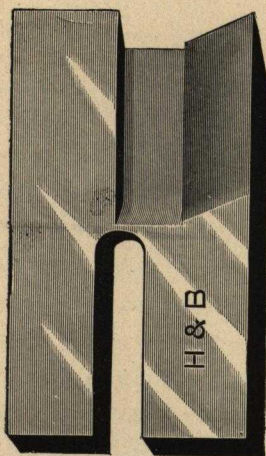
No. 23 Door.



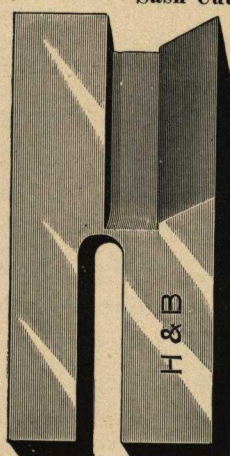
No. 24 Door or Sash.

For Description and Price, see page 342 and 343.

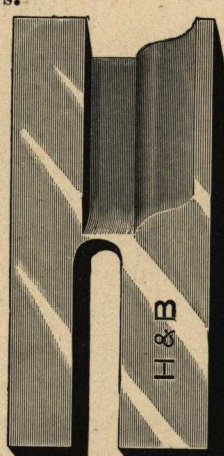
SOLID MILLED CUTTERS.
Sash Cutters.



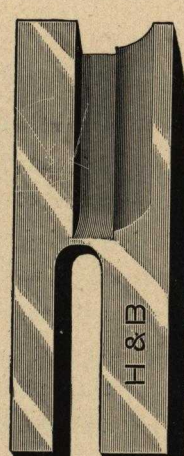
No. 1 Bevel.



No. 2 Bevel.

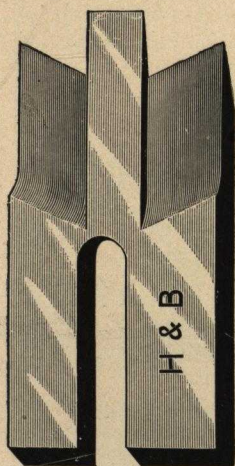


No. 3 Ogee.

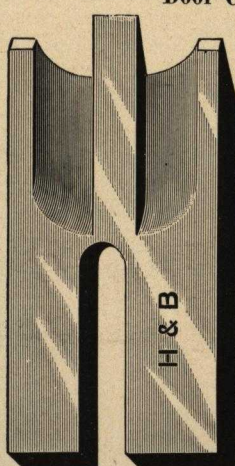


No. 4 Oval.

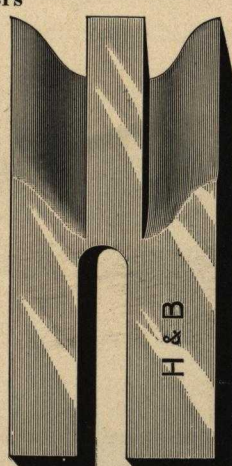
Door Cutters



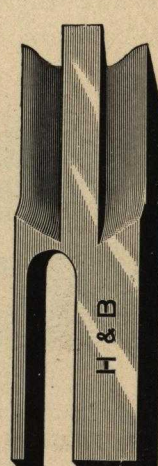
No. 5 Bevel.



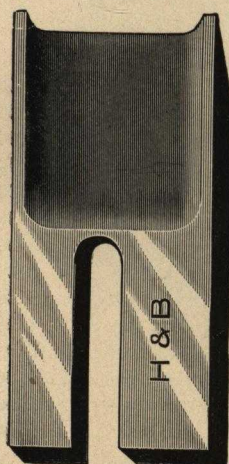
No. 6 Oval.
Blind, Slat, Rod and Stile Cutters.



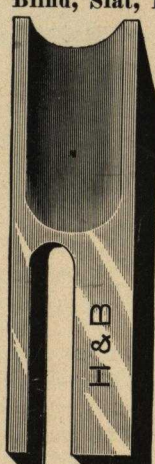
No. 7 Ogee.



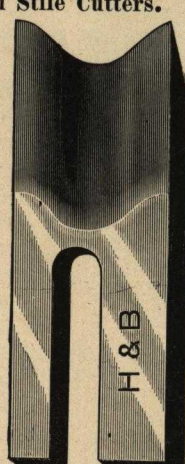
No. 8 Ogee and Bevel.



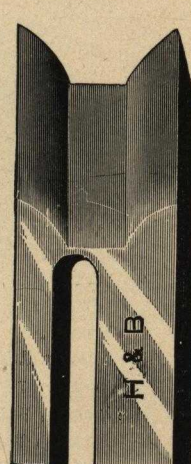
No. 9 Slat.



No. 10 Rod.



No. 11 Ogee.



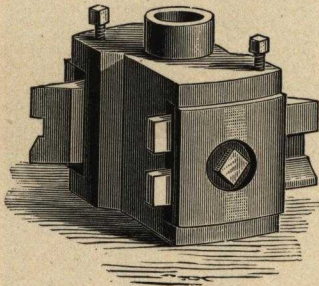
No. 12 Cove or Rounded Edge.

For Description and Price, see pages 342 and 343.

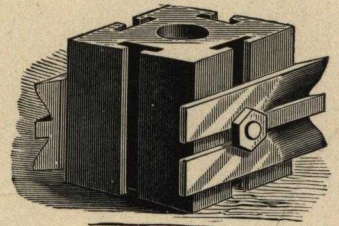
SOLID MILLED BITS.

For Flooring, Ceiling, Doors, Sash, Slats, Etc.

We present on Pages 340 and 341 a few samples of the Solid Milled Bits in general use, which we are called upon to furnish. These Bits are formed by milling into the face of the steel the desired shapes, instead of forming the shape of the mould on the edge of the cutters. The form of the moulding made by the Solid Milled Bit is always retained permanently by simply grinding to the standard level, no filing or fitting to the shape being required while the form of a moulding worked by a bit shaped on the bevel is liable to be changed in sharpening the cutter. The Solid Milled Bits are placed upon the Head just the reverse from those where the form is worked upon the bevel of the Bit; in other words the Solid Milled Bits are placed with the bevel side of the Bit against the Head, and the Milled or shape side of Bit on the outside. The cutters made in this manner are much more easily set, and their durability greater, and the method of sharpening is much more accurate than the old form of moulding cutters. All that is required is to grind the bevel on the inside next the Head and opposite the Milled side.



Capped Head, showing how the solid milled bits should be used.



Open or Slotted Head, showing how the solid milled bits should be used.

PRICE OF SOLID MILLED BITS AND COPE CUTTERS.

No. 1 and 2, Bevel Sash, per pair	\$3 00	No. 15, Tongue, per set (4)	\$6 00
" 2, Ogee Sash, per pair	3 00	" 16, Groove, per set (4)	6 00
" 4, Oval Sash, per pair	3 00	" 15, Tongue, per set (6)	8 00
" 5, Bevel Door, per pair	3 50	" 16, Groove, per set (6)	8 00
" 6, Oval Door, per pair	3 50	" 17, Double Tongue, per set (4)	6 00
" 7, Ogee Door, per pair	3 50	" 18, Double Groove, per set (4)	6 00
" 8, Ogee and Bevel Door, per pair	3 50	" 17, Double Tongue, per set (6)	8 00
" 9, Blind Slat, per pair	3 00	" 18, Double Groove, per set (6)	8 00
" 10, Blind Rod, per pair	3 00	" 19-20, 2 Beads, from $\frac{1}{8}$ to $\frac{1}{2}$, per pair..	3 00
" 11, Ogee Blind, per pair	3 00	" 19-20, 3 Beads, from $\frac{1}{8}$ to $\frac{1}{2}$, per pair..	4 00
" 12, Cove or Round edge, per pair	3 00	" 19-20, 4 Beads, from $\frac{1}{8}$ to $\frac{1}{2}$, per pair..	5 00
" 13, Tongue, per set (4)	6 00	" 21, Sash Cope, Ogee, per pair	2 00
" 14, Groove, per set (4)	6 00	" 22, Door Cope, Ogee, per pair	2 00
" 13, Tongue, per set (6)	8 00	" 23, Door Cope, Ogee, per pair	2 00
" 14, Groove, per set (6)	8 00	" 24, Sash or Door Bevel, per pair	2 00

How to Order Solid Milled Bits.

For Sash Nos. 1, 2, 3 and 4, give thickness of Sash, and whether Bevel, Ogee or Oval; if Slotted, give position of Slots; if plain without Slots, give thickness of Bit.

For Doors Nos. 5, 6, 7 and 8, give same directions as for Sash.

For Slats No. 9, give width and the thickness of Slat, and whether Slotted or plain; if plain, give thickness of Bit; if Slotted, give position of Slots.

For Blind Rods No. 10, give size of Rod, whether Slotted or plain; if plain, give thickness of Bit; if Slotted, give position of Slots.

For Blinds No. 11, give thickness of Blinds, whether Slotted or plain; if plain, give thickness of Bit; if Slotted, give position of Slots.

For Blinds No. 12, give same directions as No. 11.

For Flooring or Ceiling Nos. 13 and 14, give thickness of Flooring or Ceiling, and thickness of Bit, and whether 4 or 6 Bits are required for a Set.

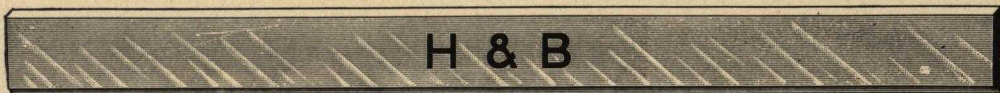
For Flooring or Ceiling Nos. 15 and 16, give position of Slots; other directions same as Nos. 13 and 14.

For Double Ceiling Nos. 17 and 18, the tongue and groove is marked double, and then split on resawer. Give thickness of Ceiling, thickness of Bit, if plain; if Slotted, give position of Slots.

For Beading Nos. 19 and 20, give size and number of Beads required. If plain, give thickness of Bit; if Slotted, give position of Slots.

Cope Cutters Nos. 21, 22, 23 and 24 are not Milled, the shapes being worked on the bevel. In ordering, if not for our machine, give width of Bit and size of Slot; if for our machine this would not be necessary, but in all cases advise us whether for top or bottom Head, also advise us whether they are desired for Ogee or Bevel Sash or Doors.

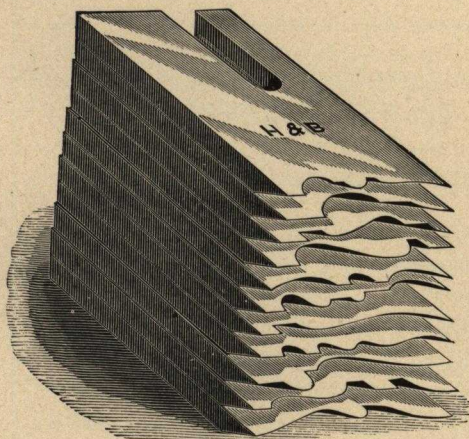
SHAPER STEEL FOR OPEN HEADS.



This Steel is ground and finished on both sides, $\frac{1}{4}$ inch thick, in strips 18 inches long and the edges beveled to fit the heads, so it can be cut any desired length for bits. All widths are kept in stock from $\frac{1}{4}$ to 3 inches.

Price, per inch..... 5 cents.

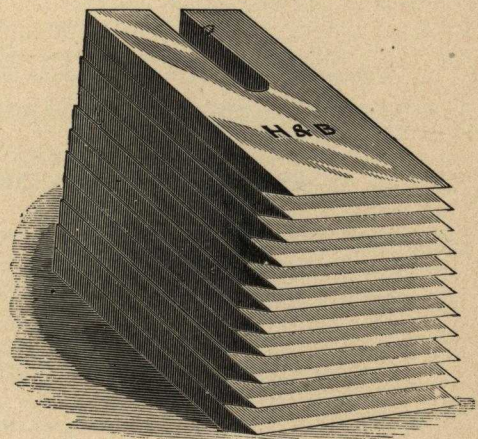
MOULDING CUTTERS.



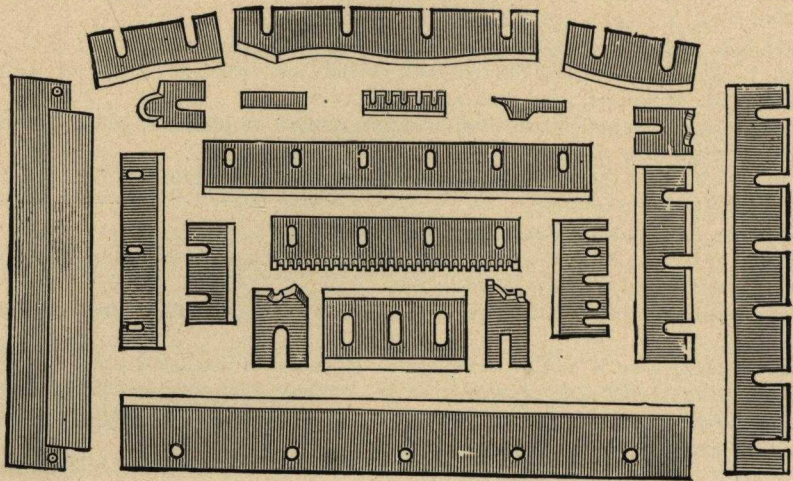
All Moulding Cutters, with edge worked to pattern, $\frac{3}{8}$ thick or less, 40 cents per inch. Advance for extra thickness.

MOULDING CUTTER BLANKS.

Slotted, Ground and Beveled.



Moulding Cutter Blanks (not tempered), $\frac{3}{8}$ thick or less, 5 inch wide or less.
 2 in. long or less, 25c. each.....over 4 to 5, 60c.
 Over 2 to 3 long, 35c. each.....over 5 to 6, 70c.
 Over 3 to 4 long, 50c. each.
 Advance 20 per cent. over 5 in. wide.
 Advance for extra thickness.



NET PRICE LIST OF MACHINE KNIVES.

PRICES OF PLANING KNIVES AND OTHER ORDINARY STRAIGHT KNIVES OF SAME FINISH, 3-8 OF AN INCH THICK OR LESS.

PRICES PER INCH.	Over 6 to 31 long.	Over 31 to 40.	Over 40 to 50.	Over 50 to 60.	Over 60 to 70.	Over 70 to 80.	Over 80 to 90.	Over 90 to 100.
4 in. wide, or less,	12	14	16	19	22	26	30	35
Over 4 to 4½ inch,	15	17	19	22	25	29	33	38
Over 4½ to 5 inch,	18	20	22	25	28	32	36	41
Over 5 to 5½ inch,	21	23	25	28	31	35	39	44
Over 5½ to 6 inch,	24	26	28	31	34	38	42	47
Over 6 to 6½ inch,	27	29	31	34	37	41	45	50
Over 6½ to 7 inch,	30	32	34	37	40	44	48	53
Over 7 to 7½ inch,	33	35	37	40	43	47	51	56
Over 7½ to 8 inch,	36	38	40	43	46	50	54	59

Knives wider or longer than given in list increase in same proportion, which is 3 cents each ½ inch (or fractional part) in width, and 5 cents each 1 inch, or fractional part in length.

STRAIGHT KNIVES 6 INCHES LONG OR LESS.

2 in. long or less, 4 in. wide or less, 50 cts. each.					If over 4 in. wide, increase 1-6 for each one inch, or fractional part thereof.
Over 2 to 4 in. long, 4 " " 62 "					
Over 4 to 6 in. long, 4 " " 75 "					

ADVANCE AS FOLLOWS FOR EXTRA THICKNESS ON ALL KNIVES.

7-16 thick.....10 per cent.	¾ thick.....30 per cent.
½ thick.....15 per cent.	1 thick.....35 per cent.
⅓ thick.....20 per cent.	1¼ thick.....50 per cent.
¼ thick.....25 per cent.	1½ thick.....75 per cent.

NET PRICE LIST OF MACHINE KNIVES,—Continued.

Flat knives with irregular edges, not moulding knives, add 50 per cent to list of straight knives. (This is intended to cover knives with slightly curved or irregular edges, which can be done on grindstone.

All moulding Cutters, with edge worked to pattern, by the 100 inches, 35 cts. per inch; less than 100 inches, 40 cts. per inch.

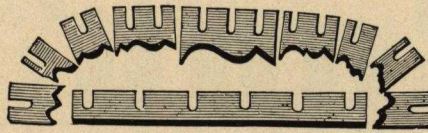
Plated Stock in bars for Moulding Cutters, 20 cts. per pound.

Irregular knives, not otherwise provided for, extra price to cover increased cost.

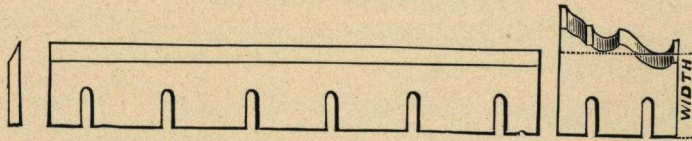
MOULDING CUTTER BLANKS (not tempered) $\frac{3}{8}$, thick or less, 5 in. wide or less,

2 in. long or less 25c. each. Over 3 to 4 long 50c. each. Over 5 to 6 long 70c. each.

Over 2 to 3 long 35c. each. Over 4 to 5 long 60c. each. Advance 20 per ct. over 5 in wide



We can furnish any style or kind of Planing knife, for any kind of machine, at short notice. Also, Moulding and Matcher Cutters, etc. If they are for a machine furnished by us we can usually tell what is wanted by specifying which machine it is for. But it is always better to send a paper pattern, showing the style of knife and the slots or bolt holes, (see directions) and then there will be no mistake.



DIRECTIONS FOR ORDERING KNIVES.

Lay the knife upon paper, with the bevel side up, (see cut.) Mark round it, showing exact size and position of the slots. Give thickness and bevel. State the name of the builder of the machine, and number of knives to the set.

How to order Cutters by number on page 346

Nos. 1, 8, 16, 22, 23, 25 and 32, a short piece should be sent as sample giving length.

Nos. 2, 3, 6 and 7, order same as directed above.

Nos. 4 and 5, same as directed, stating whether for straight or O. G. Panels.

Nos. 14 and 15, give exact length, width and thickness, whether lipped or plain.

Nos. 11 and 13, give exact length, width and thickness, whether for flooring or ceiling, whether for 2 or 3 winged heads.

No. 12, give us the number from some Standard Moulding Book, or send drawing or piece of moulding you wish to work and the size machine they are to work on.

Nos. 9 and 10, give thickness and widths.

No. 17, give exact length, width and number.

Nos. 18, 19, 20, give width and length.

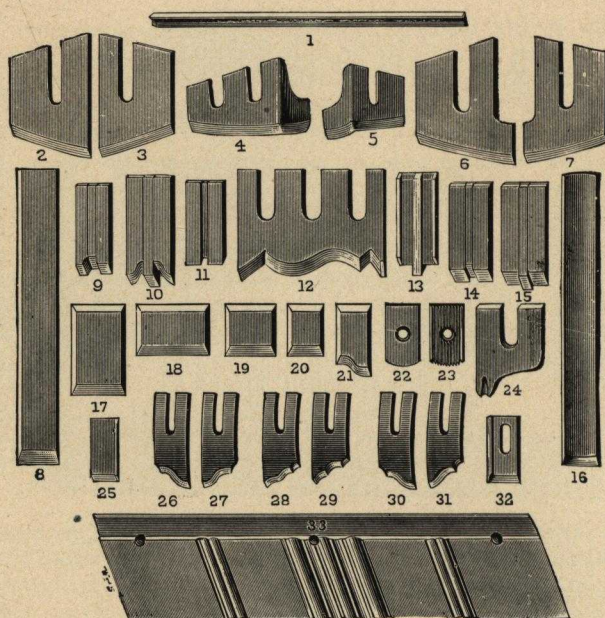
No. 21, send shape of moulding wanted.

No. 24, give number only.

Nos. 26, 27, 28, 29, 30 and 31, give length, width and size of slots, and whether bent circular or square.

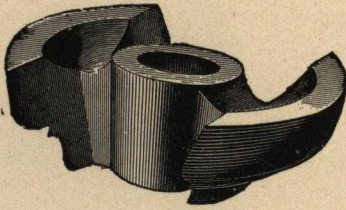
No. 33, send pattern and give maker's name of Lathe.

If knives or cutters are wanted for machines manufactured or furnished by us, by simply mentioning what is wanted will be sufficient.

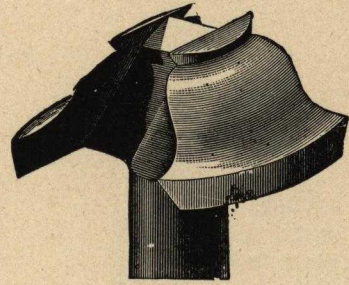


PRICE LIST OF CUTTERS.

No. 1.	Gauge Lathe, V Shape, roughing cutter, 12 inch long, price each,	-	-	\$1 25
" 2.	Bottom Inside Tenoner, per pair,	-	-	1 86
" 3.	Top " " "	-	-	1 86
" 4.	Panel Raiser, per inch,	-	-	40
" 5.	" " " "	-	-	40
" 6.	Bottom Outside Tenoner, per pair,	-	-	1 86
" 7.	Top " " " "	-	-	1 86
" 8.	Flat Round Edge Gauge Lathe, roughing cutter, 12 inch long, each,	-	-	1 25
" 9.	O. G. Sash, each,	-	-	30
" 10.	O. G. Door, each,	-	-	30
" 11.	Solid Milled Matcher, Tongue Side, each,	-	-	1 12
" 12.	Moulding, by the 100 inches, 35 cts. per inch (less), per inch,	-	-	40
" 13.	Solid Milled Matcher, Groove Side, each,	-	-	1 12
" 14.	Common Matcher, Tongue Side, each,	-	-	35
" 15.	Common Matcher, Groove Side, each,	-	-	35
" 16.	Gauge Lathe, circle roughing, 12 inch long, each,	-	-	1 25
" 17.	Jointer for Side Head, 2½ inch wide, 62 cts., 3¼ inch wide, each,	-	-	62
" 18.	3 inch Plated Shaper Cutter, for open Head, each,	-	-	75
" 19.	2 " " " " " " " "	-	-	62
" 20.	1½ " " " " " " " "	-	-	50
" 21.	O. G. Shaper Cutter, for open Head, each,	-	-	60
" 22.	Plain Face, Tenon Spurs, per pair,	-	-	1 00
" 23.	Corrugated Face, Tenon Spurs, per pair,	-	-	1 50
" 24.	Beading Cutters for Ceiling used in Slotted Head, per pair,	-	-	2 00
" 25.	Chair Stretcher Cutters, each,	-	-	60
" 26.	Top O. G. Door Cope Cutters, per pair,	-	-	1 50
" 27.	Bottom O. G. Door Cope Cutters, per pair,	-	-	1 50
" 28.	Sash Cope Cutters, per pair,	-	-	1 50
" 29.	" " " " " " " "	-	-	1 50
" 30.	Top O. G. Door Cope Cutters, per pair,	-	-	1 50
" 31.	Bottom O. G. Door Cope Cutters, per pair,	-	-	1 50
" 32.	Chair Stretcher Shoulder Cutters, each,	-	-	70
" 33.	Chair Leg Back Knife, per inch,	-	-	\$1 50 to 2 00



SOLID EDGE MOULDING CUTTERS.



SURFACE MOULDING CUTTERS.

STYLE, SIZES AND PRICES OF OUR SOLID STEEL MOULDING CUTTERS.

All Cutters made by us are forged from BEST QUALITY TOOL STEEL, turned true and freed as shown by dotted lines in Cutters No. 13 and 13½. This is done by machinery, which insures accuracy, balance and free cutting without binding or burning the mould. They are made to any practical size and bored for any size spindle.

In Ordering always give size of Spindle and size of Collar they are to work with. It is economy to order good size. They cut faster and last longer than small ones.

When Ordering by diagram, be particular to say if diagram represents cutter or moulding.

Order by Numbers when you find what you want in these pages. Give sizes of shank and direction to run.

The Standard Size Shank for Cutters up to 3 inches diameter is $\frac{1}{2}$ inch. When 4 inches diameter or more the Shanks or Stems should be $\frac{5}{8}$ or $\frac{3}{4}$ inch.

Cuts in Class 1, pages... 349 to 353 ...represent Edge Moulding Cutters, with two or more cutting edges. They are made to reverse and cut either way, or only one way as wanted, calculated for shaping, moulding, jointing, matching and grooving. Other styles and sizes will be made to order from correct diagrams or pieces of moulding wanted.

The Cuts in Class 2, pages... 354 to 356 ...represent Cutters made for moulding, panelling and grooving the surface of lumber. These cutters will penetrate like an auger, and cut latter ally when revolving in either direction, or may be made like Nos. 50s or 58, to cut only one way, right or left, as wanted.

Cuts in Class 3, pages..... 357represent Cutters for moulding, scroll or fret work. They have a guide point proportioned to size of cutter, and are made to any moulding wanted.

Cuts in Class 4, pages..... 357represent Cutter for lining, vining, scrolling and otherwise to ornament the surface of wood.

Cuts in Class 5, pages..... 358Miscellaneous, represent Cutters for dovetailing, routing, grooving, and other miscellaneous work.

Cuts in Class 6, pages... 359 to 364 ...represent Mouldings from which Cutters may be ordered by number. Always give size of spindle and size collar it is to run with; also whether to run right or left, or reversible.

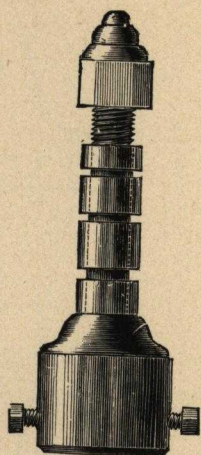
SOLID STEEL CUTTERS.

Price List.

CLASS 1.—Edge Cutters.			CLASS 1.—Continued.		
No.	INCHES.	PRICE.	No.	INCHES.	PRICE.
1.	1 $\frac{1}{4}$ x $\frac{3}{4}$	\$ 2 50	39.	1 $\frac{1}{4}$ x1 $\frac{1}{16}$	\$3 00
1 $\frac{1}{2}$.	2 $\frac{1}{4}$ x1 $\frac{1}{4}$, in two parts.....	4 75	40.	3 $\frac{1}{2}$ x1.....	6 00
2.	2x $\frac{3}{4}$	2 50	CLASS 2.—Surface Cutters.		
3.	2 $\frac{3}{8}$ x $\frac{1}{8}$	3 50	No.		PRICE.
4.	2 $\frac{1}{4}$ x1.....	4 50	50.	1 $\frac{1}{4}$ inches diameter.....	\$2 50
5.	2 $\frac{1}{8}$ x $\frac{1}{8}$	4 50	50.S	1 $\frac{1}{4}$ " ".....	2 50
6.	2 $\frac{3}{8}$ x $\frac{3}{8}$	3 00	51.	1 $\frac{1}{2}$ " ".....	3 00
7.	3 $\frac{1}{4}$ x1 $\frac{1}{4}$	6 00	52.	2 $\frac{1}{2}$ " ".....	5 00
8.	3x1 $\frac{1}{4}$	5 50	53.	1 $\frac{1}{4}$ " ".....	2 50
10.	3x1 $\frac{1}{8}$	8 50	54.	1 $\frac{1}{8}$ " ".....	2 25
12.	2 $\frac{3}{4}$ x1 $\frac{1}{8}$, in two parts.....	8 50	55.	1 " ".....	2 00
13.	2 $\frac{1}{4}$ x2 $\frac{1}{4}$	6 00	56.	$\frac{1}{4}$ " ".....	1 00
13 $\frac{1}{2}$.	3x2 $\frac{1}{4}$	8 00	57.	$\frac{3}{8}$ " ".....	1 50
14.	2 $\frac{1}{2}$ x1.....	4 00	58.	$\frac{3}{8}$ " ".....	1 50
15.	3 $\frac{1}{2}$ x2 $\frac{1}{4}$, in two parts.....	11 00	59.	1 " ".....	2 00
16.	2 $\frac{3}{4}$ x1.....	4 50	60.	$\frac{3}{8}$ " ".....	2 00
17.	3x1 $\frac{1}{4}$, in three parts.....	12 00	61.	1 $\frac{1}{2}$ " ".....	3 00
18.	3x1.....	5 00	62.	1 $\frac{3}{4}$ " ".....	3 50
19.	3x1.....	5 00	63.	1 $\frac{1}{2}$ " ".....	3 00
20.	3x2.....	7 00	64.	1 $\frac{1}{8}$ " ".....	2 25
20 $\frac{1}{2}$.	3x1 $\frac{1}{4}$	6 50	65.	2 $\frac{3}{4}$ " ".....	5 50
22.	2 $\frac{1}{4}$ x1.....	4 00	66.	2 $\frac{1}{4}$ " ".....	5 00
22 $\frac{1}{2}$.	2x $\frac{3}{8}$	2 00	67.	2 $\frac{1}{2}$ " ".....	5 00
23.	2 $\frac{3}{4}$ x $\frac{1}{4}$	4 00	68.	$\frac{3}{8}$ " ".....	1 00
24.	3 $\frac{1}{2}$ x1.....	6 00	69.	$\frac{3}{8}$ " ".....	1 00
25.	3x1.....	5 00	70.	70a, 70b, 70c, 70d, 70e, $\frac{3}{8}$ inches dia.....	1 00
26.	4 $\frac{1}{2}$ x1.....	8 00	70f, 70g,	$\frac{3}{8}$ inch diameter.....	1 25
27.	1 $\frac{1}{2}$ x $\frac{1}{2}$	2 00	71.	1 $\frac{1}{4}$ " ".....	2 50
28.	1 $\frac{3}{4}$ x $\frac{1}{4}$	2 50	72.	1 $\frac{3}{4}$ " ".....	3 50
29.	2 $\frac{1}{4}$ x $\frac{1}{4}$	3 50	73.	$\frac{3}{4}$ " ".....	2 00
30.	2 $\frac{1}{2}$ x $\frac{1}{4}$	3 50	74.	2 $\frac{3}{4}$ " ".....	5 50
31.	1 $\frac{1}{16}$ x1 $\frac{1}{16}$	3 00	75.	2 $\frac{1}{4}$ " ".....	4 50
32.	1 $\frac{1}{16}$ x1 $\frac{1}{4}$	3 50	76.	2 " ".....	4 00
33.	1 $\frac{1}{16}$ x1 $\frac{3}{8}$	3 75	77.	2 " ".....	4 00
34.	4x1 $\frac{3}{8}$	7 75	78.	1 $\frac{1}{2}$ " ".....	3 00
35.	2 $\frac{3}{8}$ x $\frac{1}{8}$	4 00	79.	$\frac{1}{2}$ " ".....	1 25
36.	1 $\frac{3}{4}$ x $\frac{1}{8}$	2 75	80.	1 $\frac{1}{2}$ " ".....	3 00
37.	1 $\frac{3}{4}$ x $\frac{1}{8}$	2 75			
38.	1 $\frac{3}{4}$ x1 $\frac{1}{16}$	3 00			

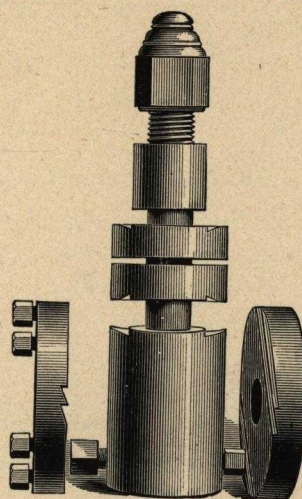
CLASS 3.—Bracket Moulding Cutters.

No.		PRICE.	No.		PRICE.
100.	$\frac{7}{16}$ inches diameter.....	\$1 00	104.	$\frac{3}{8}$ inches diameter.....	\$1 50
101.	$\frac{3}{8}$ " ".....	1 50	105.	$\frac{7}{8}$ " ".....	2 00
102.	$\frac{1}{2}$ " ".....	2 00	106.	1 " ".....	2 25
103.	1 $\frac{3}{16}$ " ".....	2 50	107.	$\frac{3}{4}$ " ".....	2 00



Steel Chuck for Edge Moulding Cutters.

PRICE, - \$8.50.



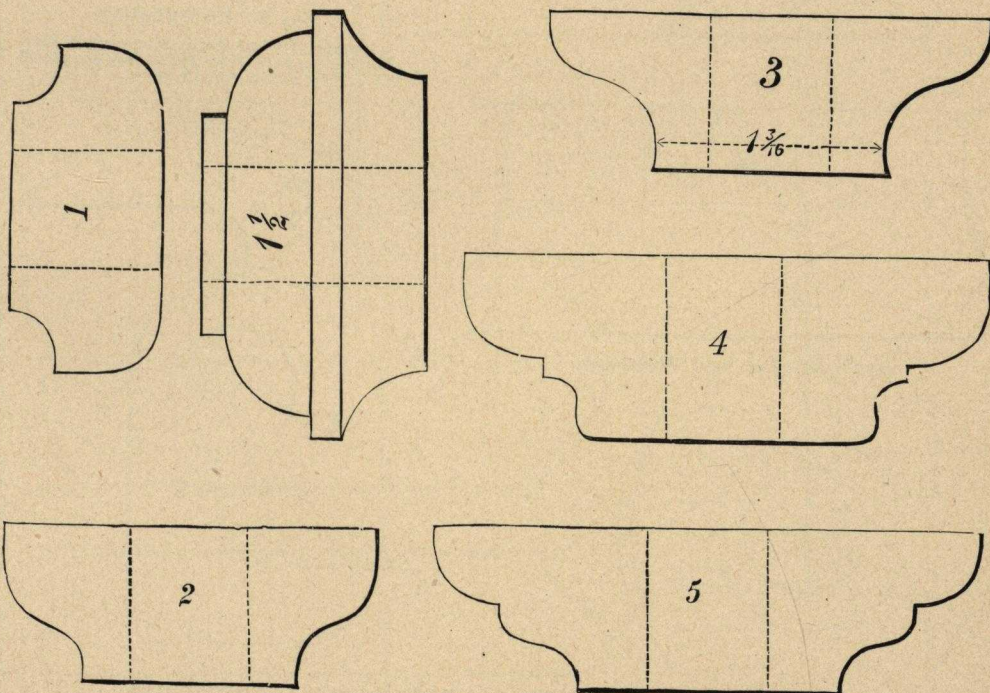
Large Steel Chuck with Slotted Collars.
For the Accommodation of Flat Knives.

PRICE, - \$14.00.

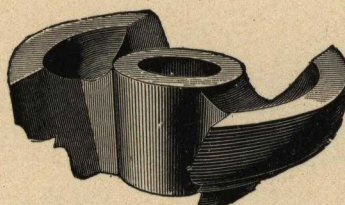
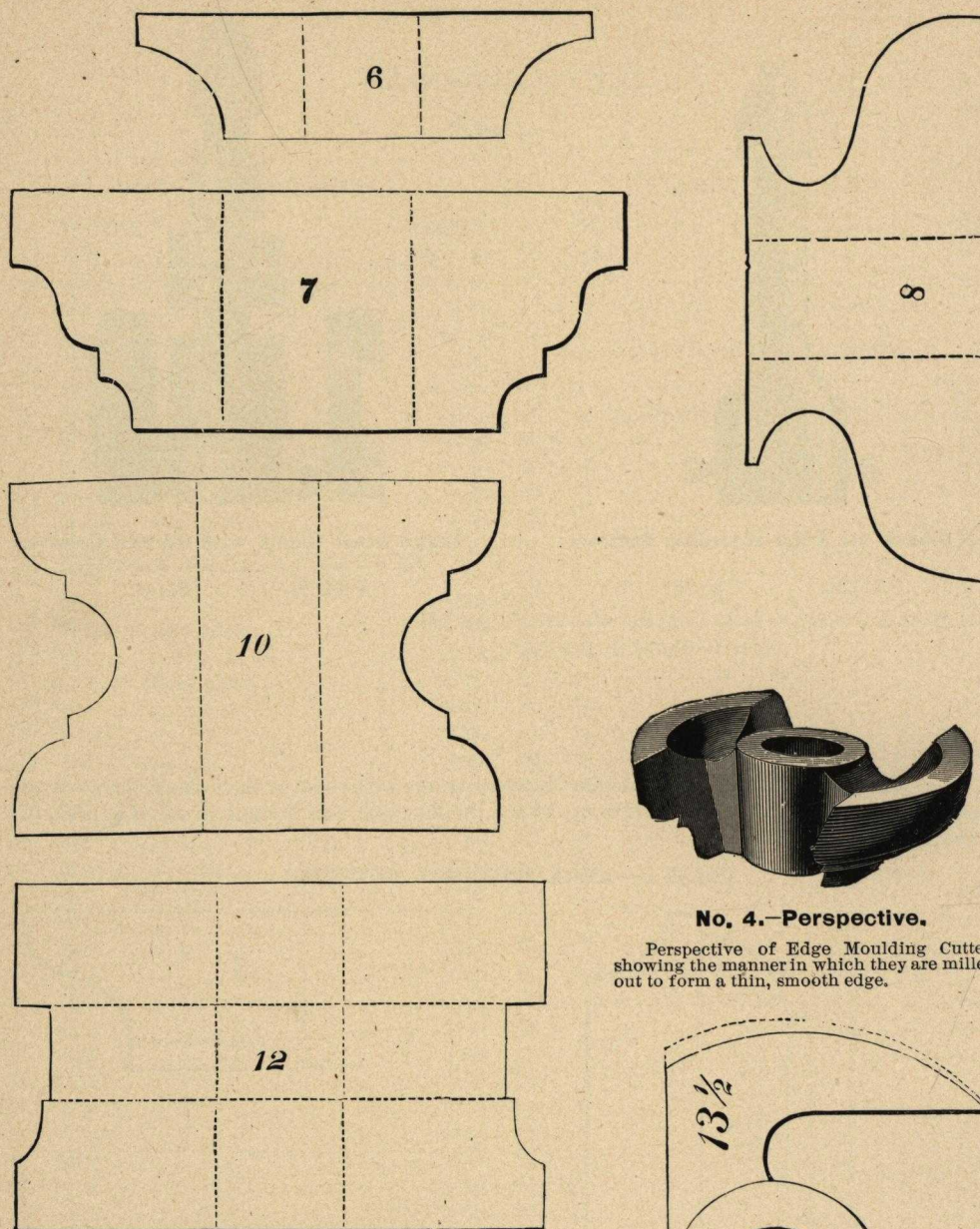
Steel Slotted Collars, 2 inch diameter and under, per pair,					\$3 00
"	"	2½ inch diameter, per pair,	"	"	3 50
"	"	3 " " " "	"	"	4 50
"	"	3½ " " " "	"	"	5 00
"	"	4 " " " "	"	"	6 00
Cast Iron Filling up Collars, each,					50

In ordering these collars be particular and give us the exact size of the hole or turn a hard wood piece the right size and send it to us, unless the machine was bought of us, if so we will insure a fit.

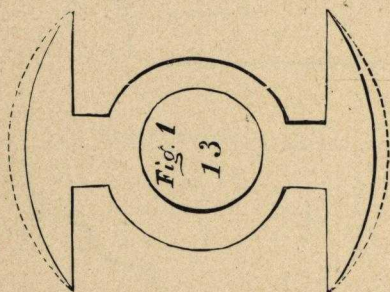
CLASS 1.—EDGE MOULDING CUTTERS.



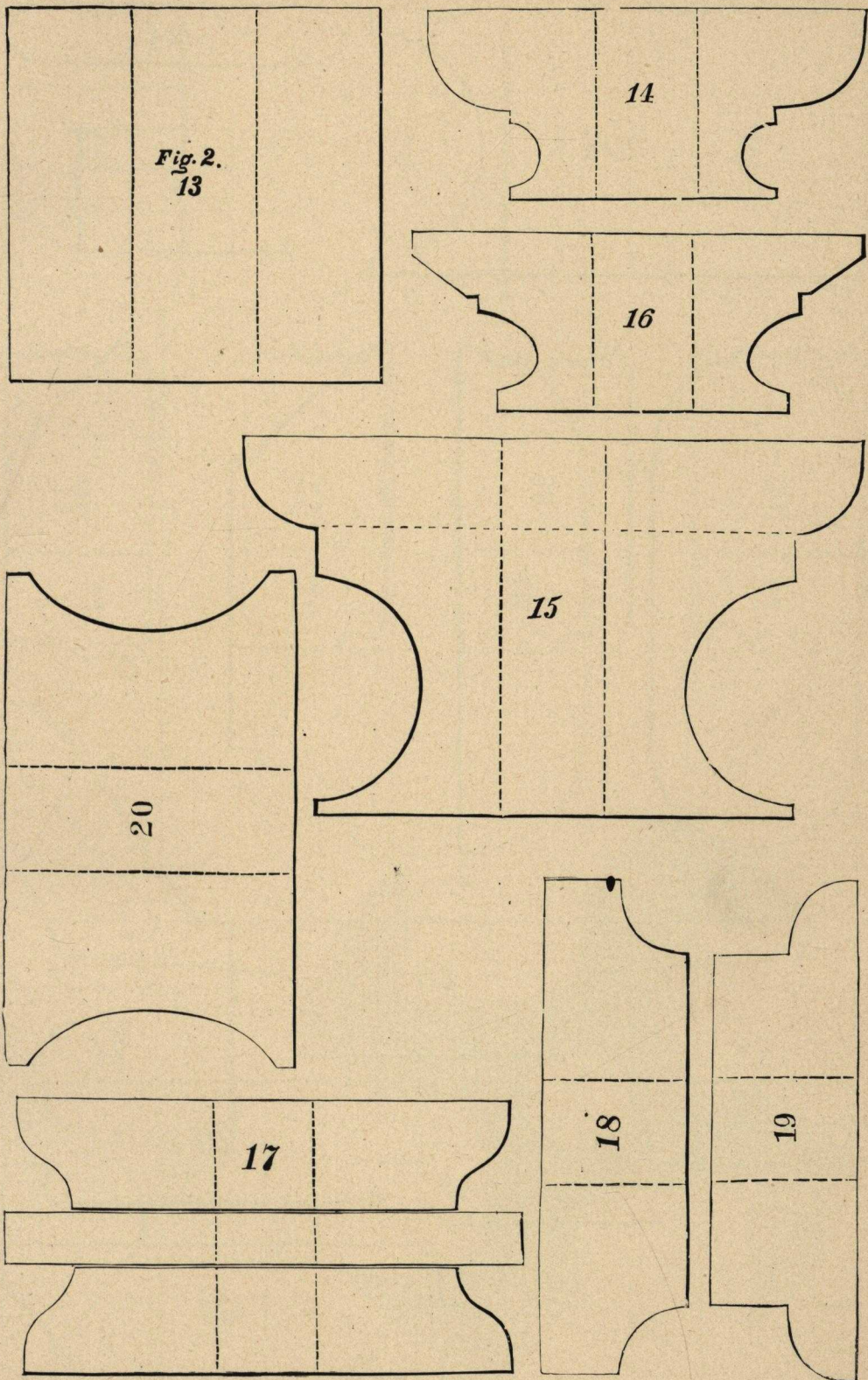
CLASS 1.—Edge Moulding Cutters

**No. 4.—Perspective.**

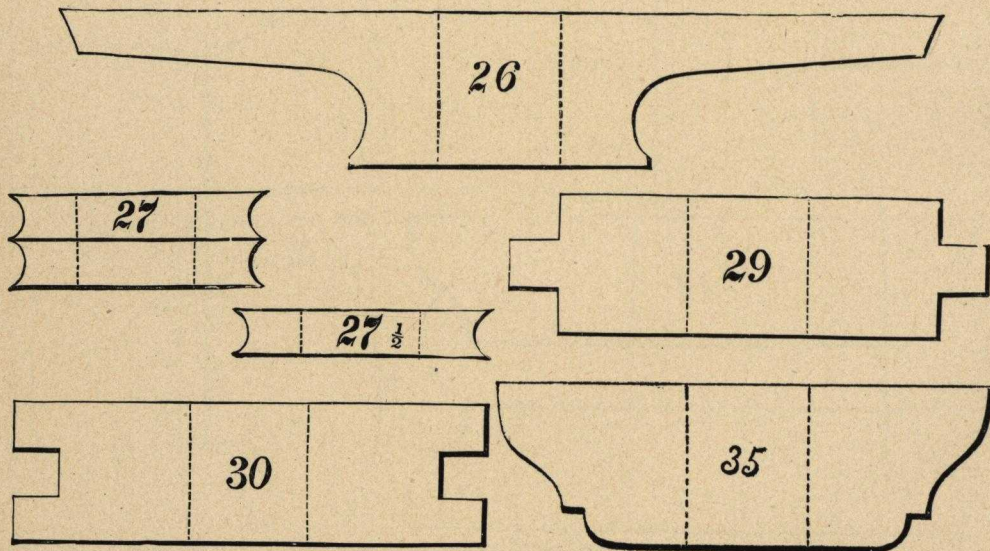
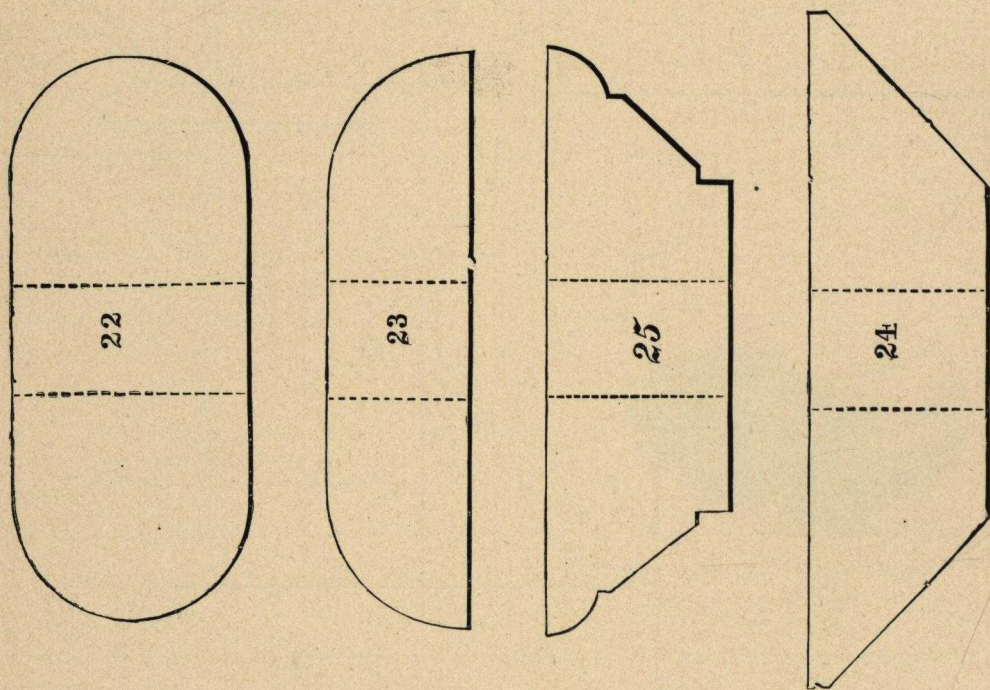
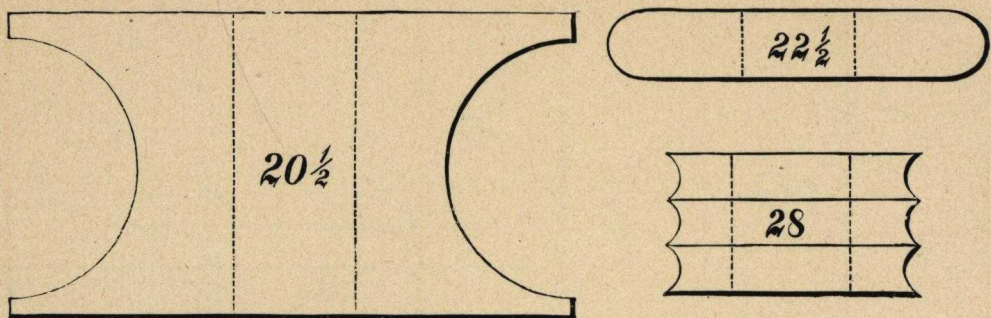
Perspective of Edge Moulding Cutter, showing the manner in which they are milled out to form a thin, smooth edge.

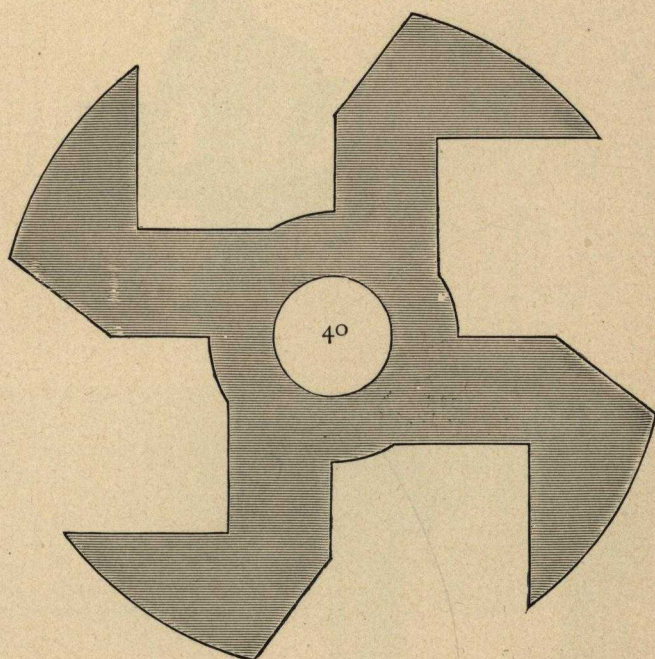
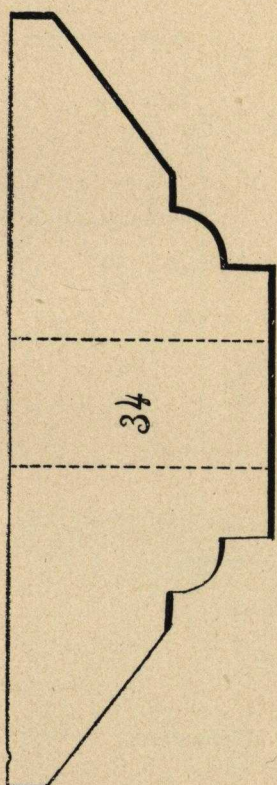
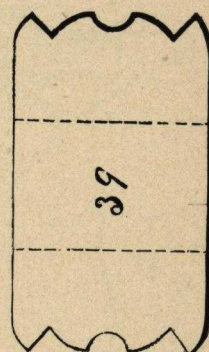
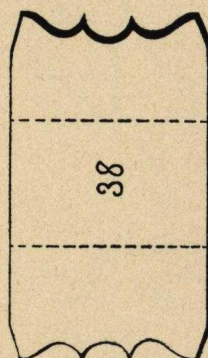
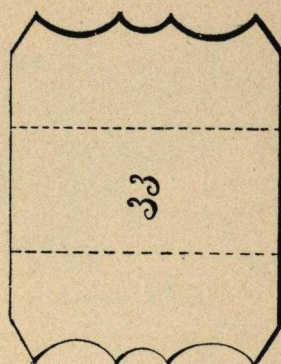
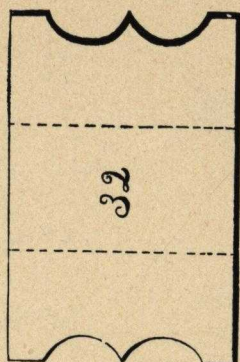
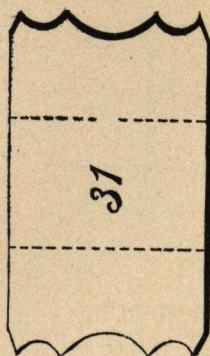
Sash Sticker and Moulder.

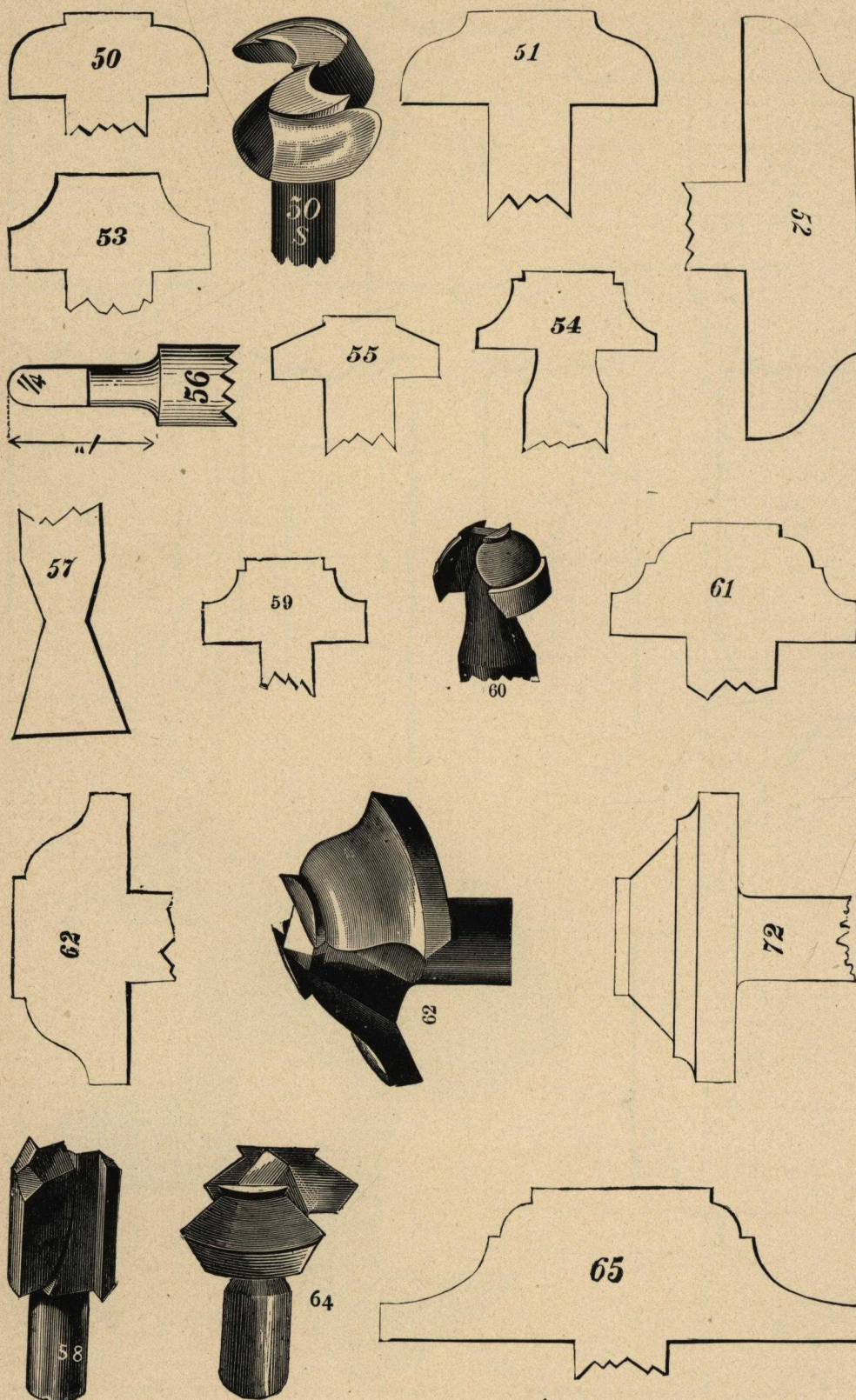
Dotted Lines show the amount of freedom we give our Cutters.

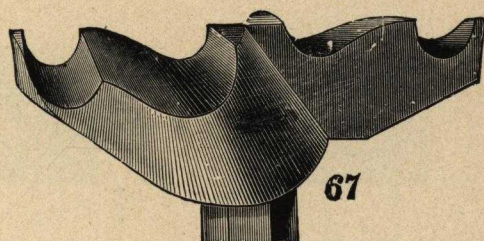
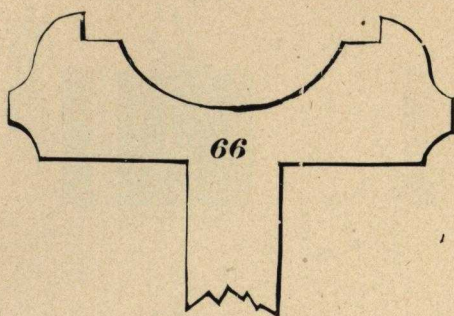


Door-Rail Moulder and Groover.

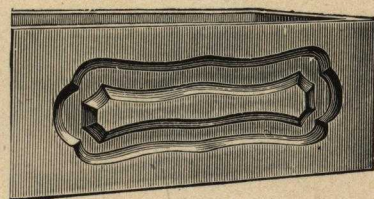
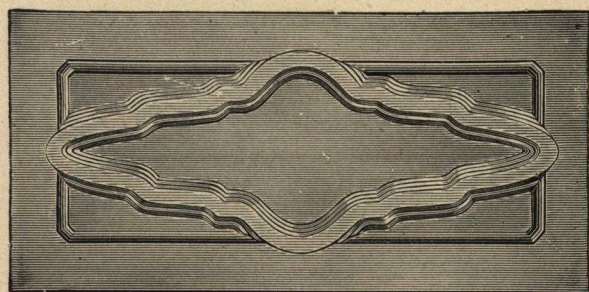
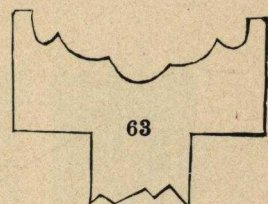
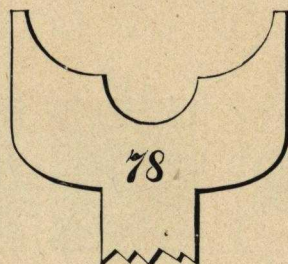
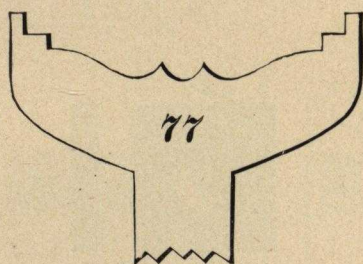
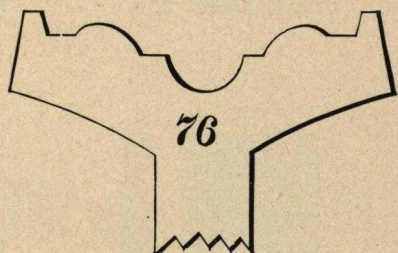
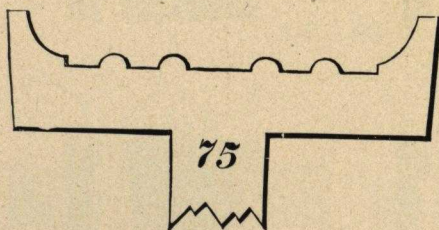
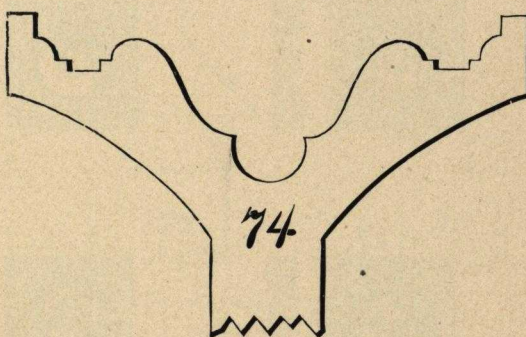
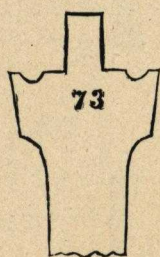
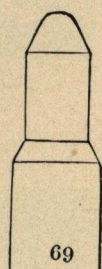
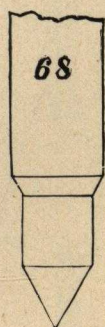


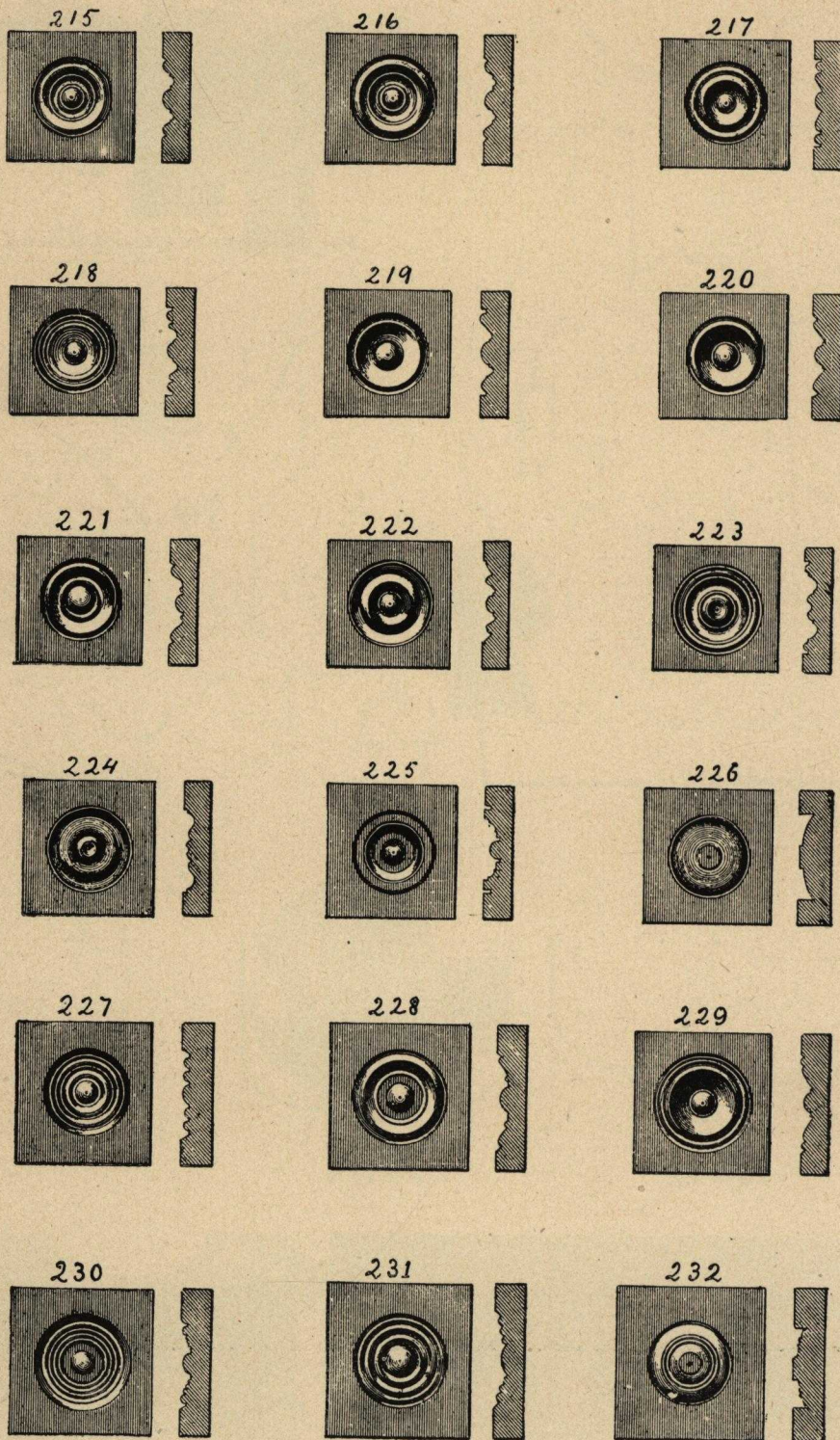




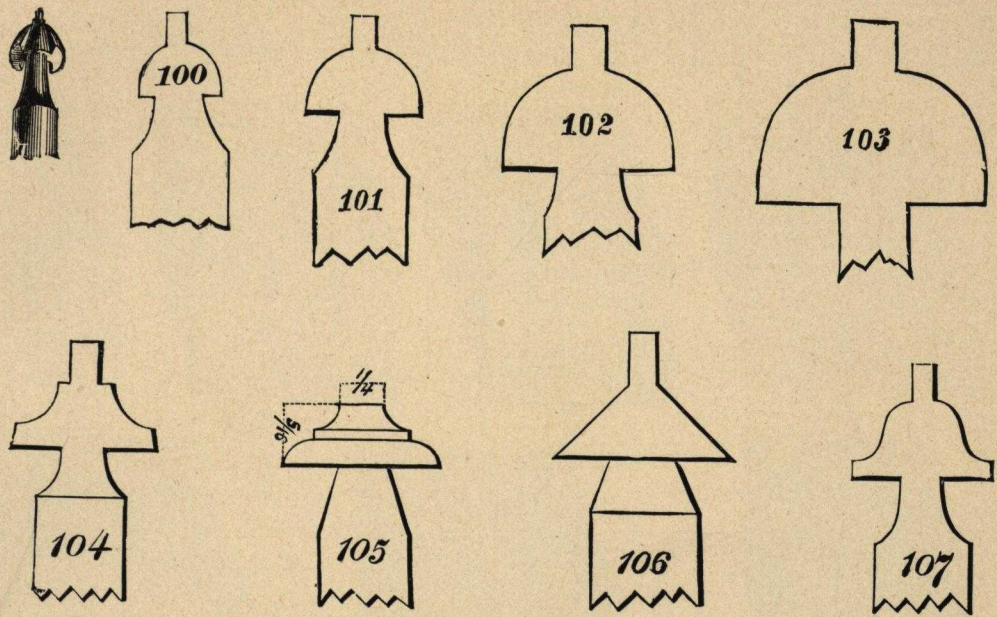


For Rosettes or Corner Blocks.



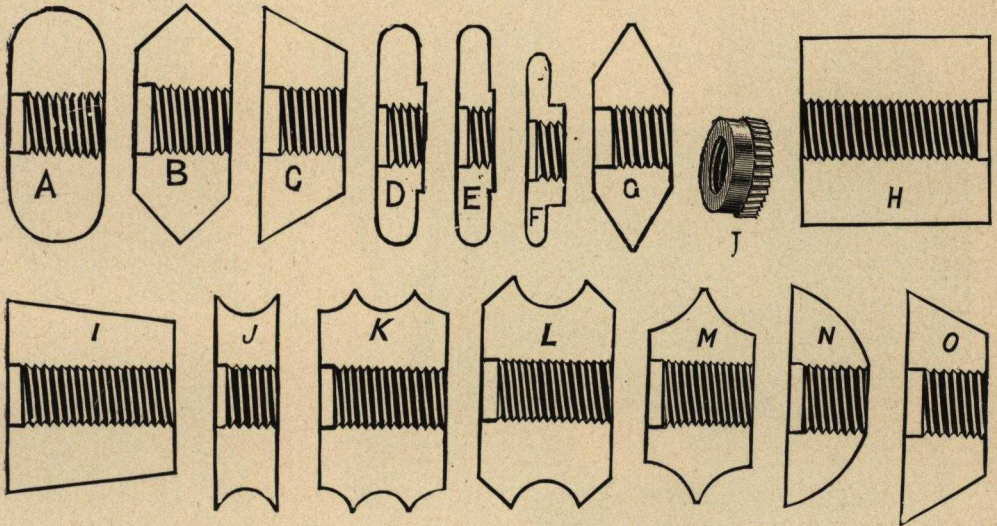


Rosettes, \$2.00 per Inch of Diameter.



These Cutters are intended for Moulding, Fret and Scroll Work.

CLASS 4.—Carving Cutters.



PRICE LIST.

		THICKNESS.								
DIAMETER.		1/8	3-16	1/4	3/8	1/2	5/8	3/4	7/8	1
1	inch.....	\$2 00	\$2 25	\$2 50	\$2 75	\$3 00	\$3 25	\$3 50	\$3 75	\$4 00
1 1/4	".....	2 50	2 75	3 00	3 25	3 50	3 75	4 00	4 25	4 00
1 1/2	".....	3 00	3 25	3 50	3 75	4 00	4 25	4 50	4 75	5 00

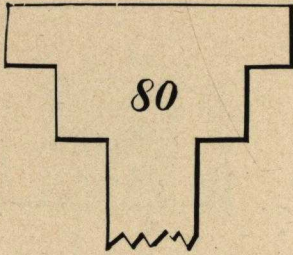
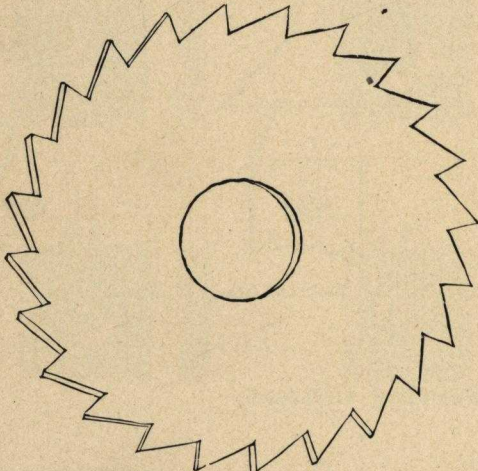
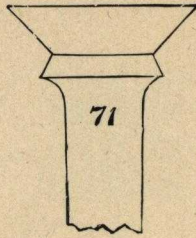
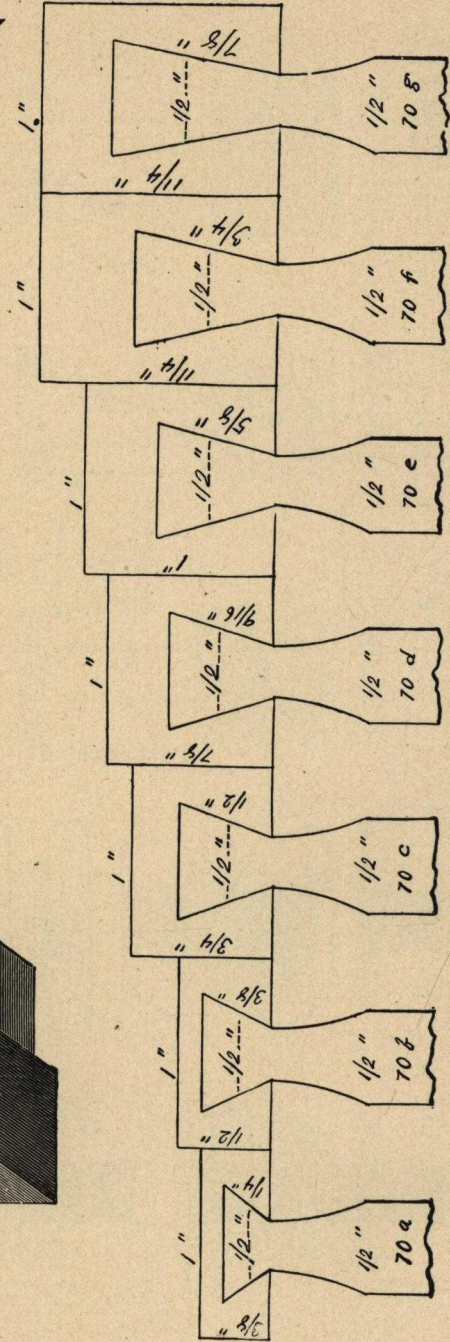
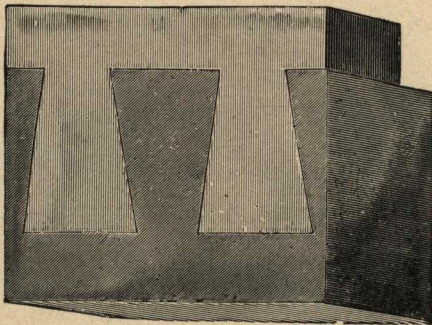
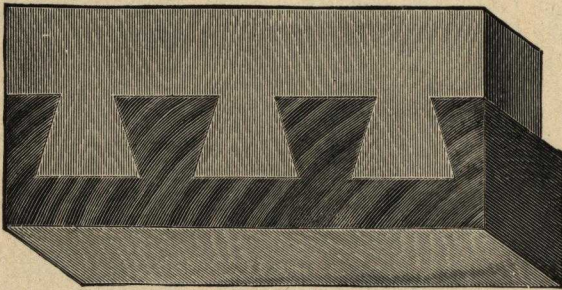


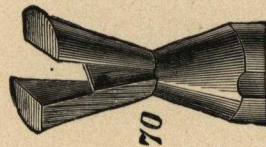
Table Run Cutters.



$2\frac{1}{2} \times 1\frac{1}{8}$ inches.



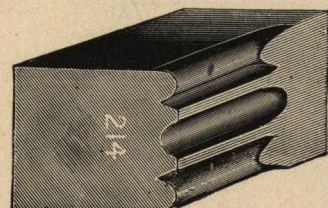
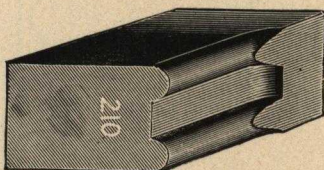
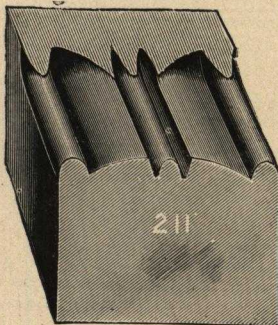
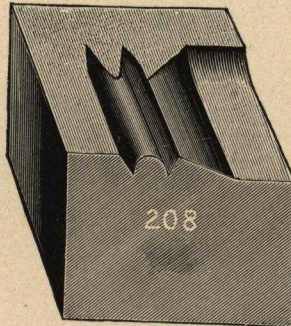
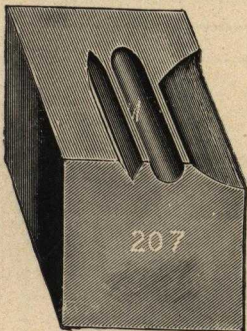
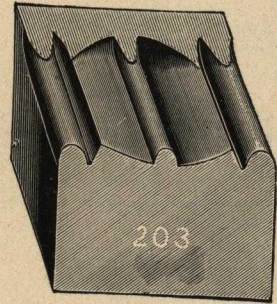
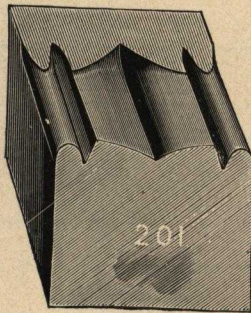
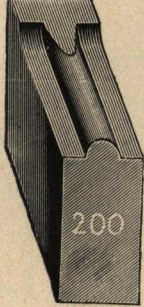
Showing Size and Shape of Cutters for Different Thickness of Lumber.



CLASS 6.—Mouldings, of any Size.

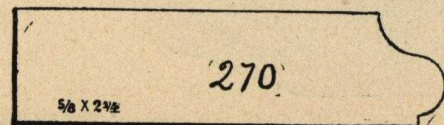
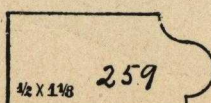
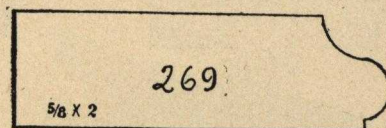
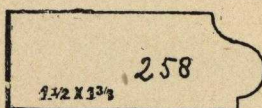
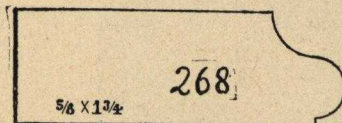
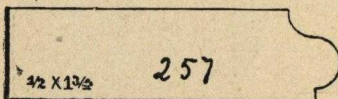
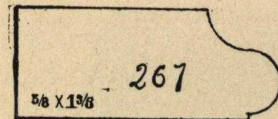
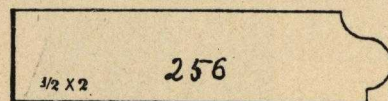
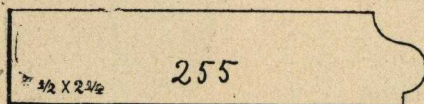
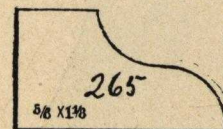
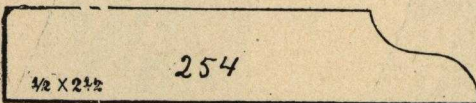
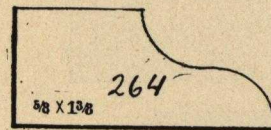
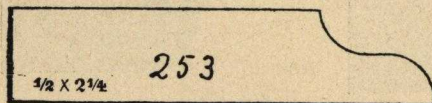
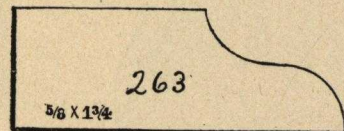
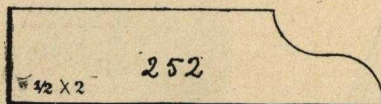
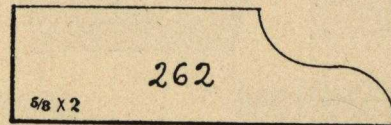
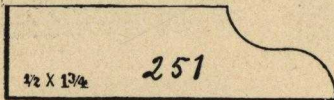
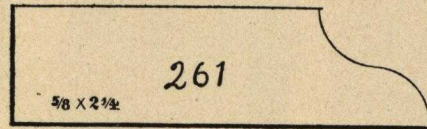
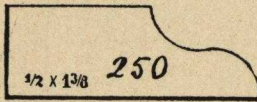
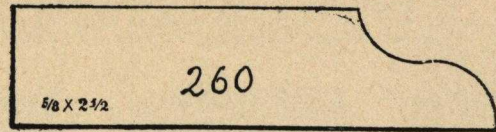
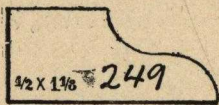
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We furnish Solid Cutters to make any Mouldings in Class 6, on application; price depends on diameter and thickness; refer to Price List, page 365. Any other styles or sizes made to order, from reversible. Always give size of spindle. Say if they are to run right or left, or



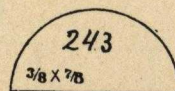
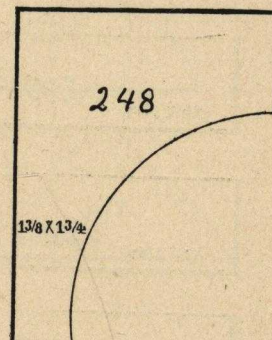
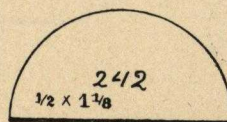
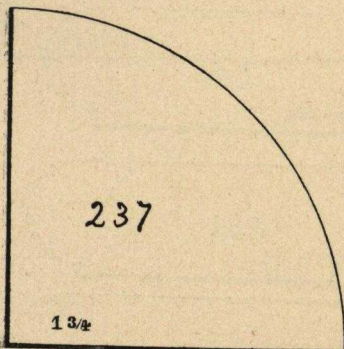
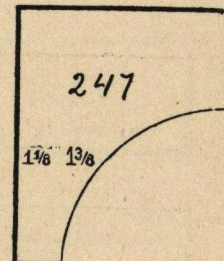
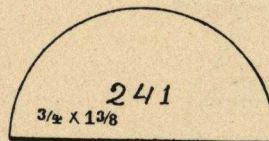
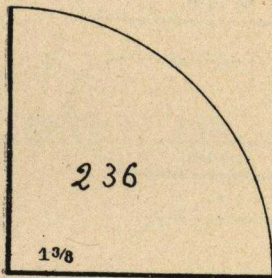
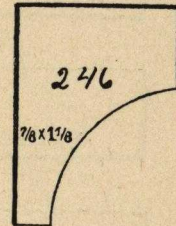
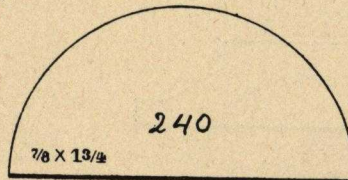
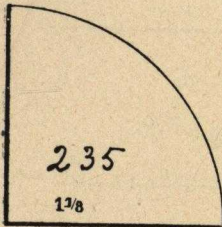
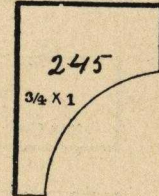
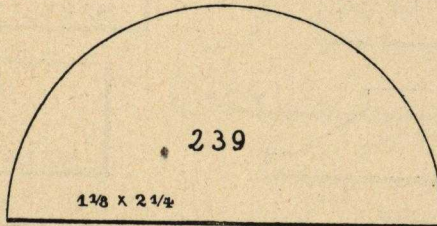
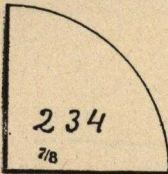
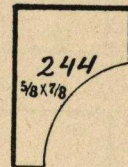
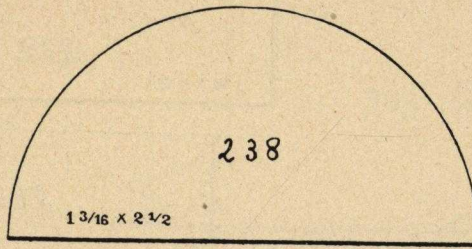
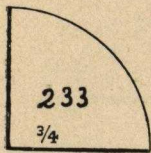
For Prices, See Page 365

CLASS 6.—Mouldings, of any Size.



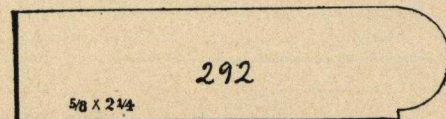
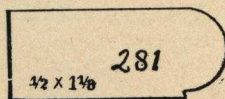
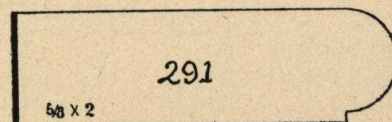
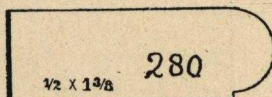
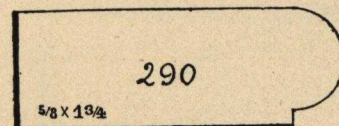
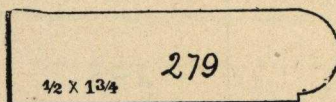
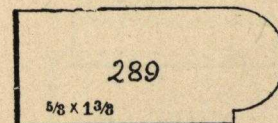
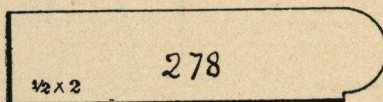
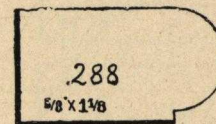
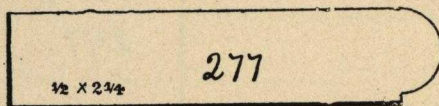
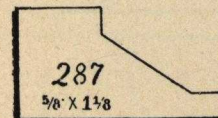
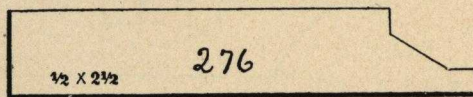
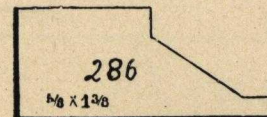
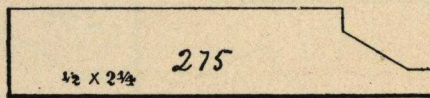
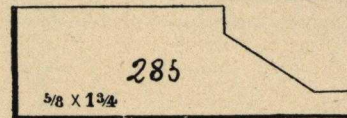
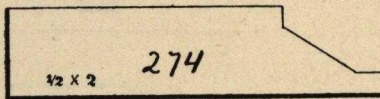
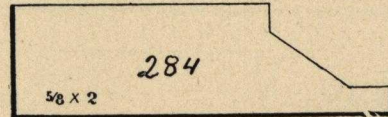
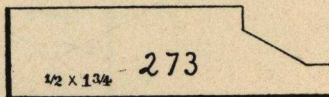
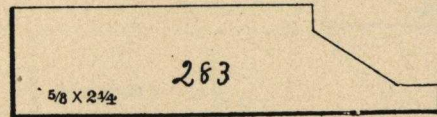
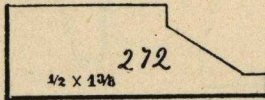
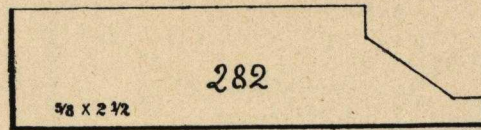
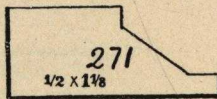
CLASS 6.—Mouldings, of any Size.

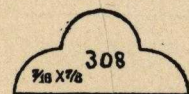
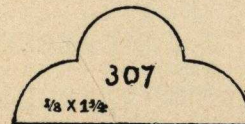
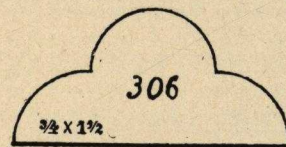
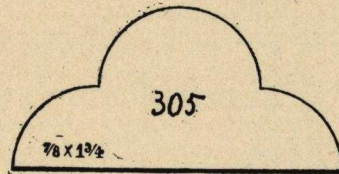
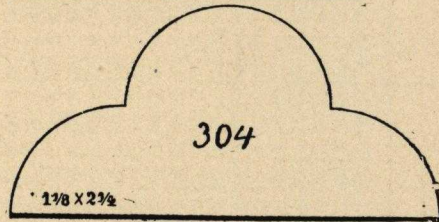
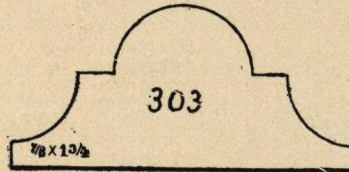
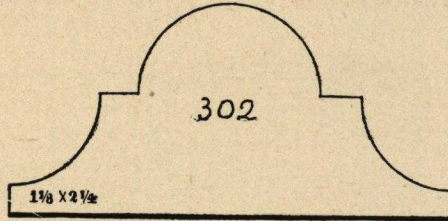
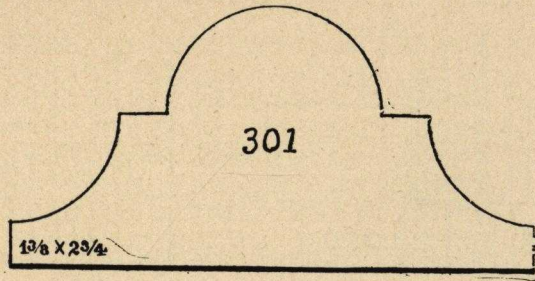
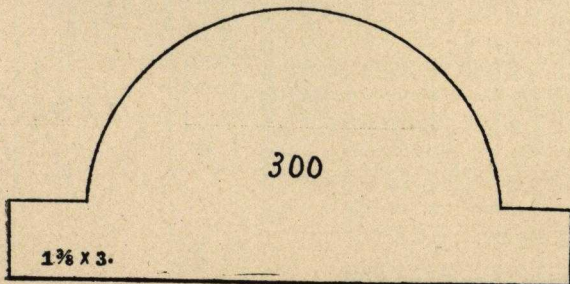
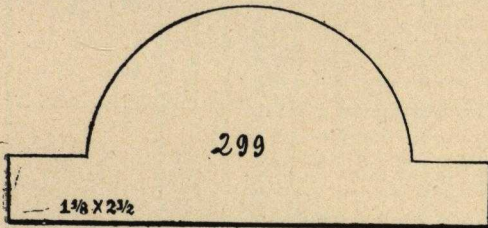
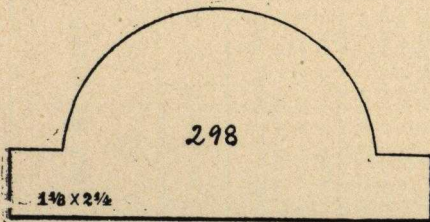
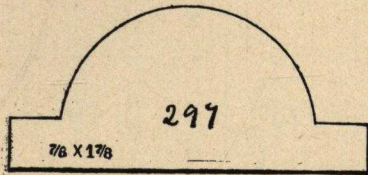
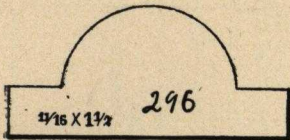
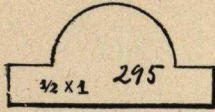
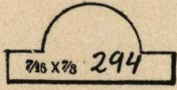
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For Prices, See Page 365

CLASS 6.—Mouldings, of any Size.





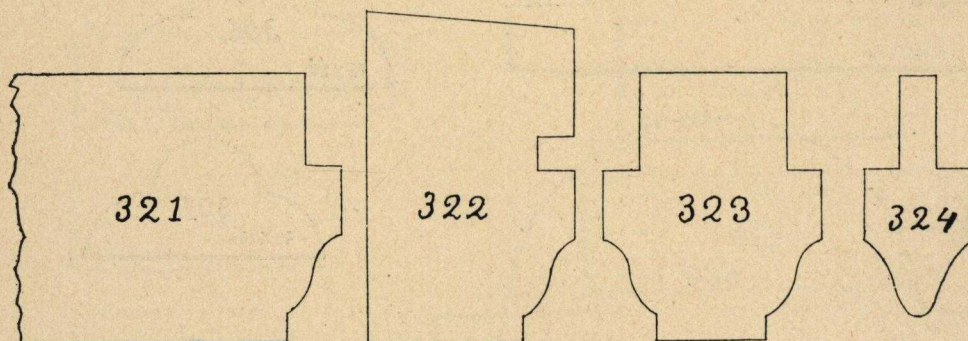
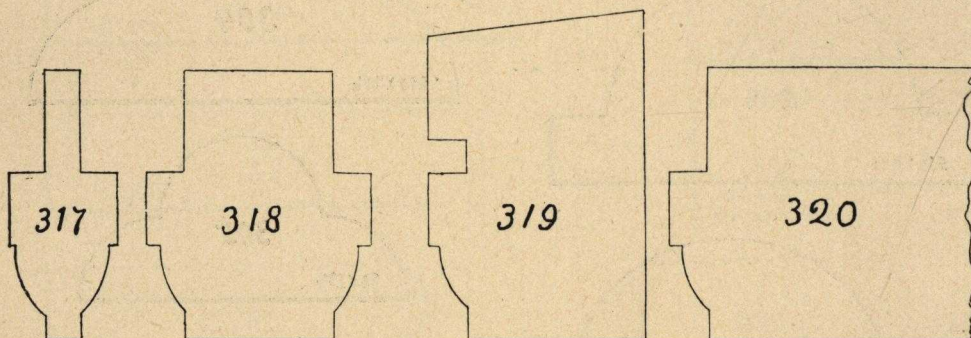
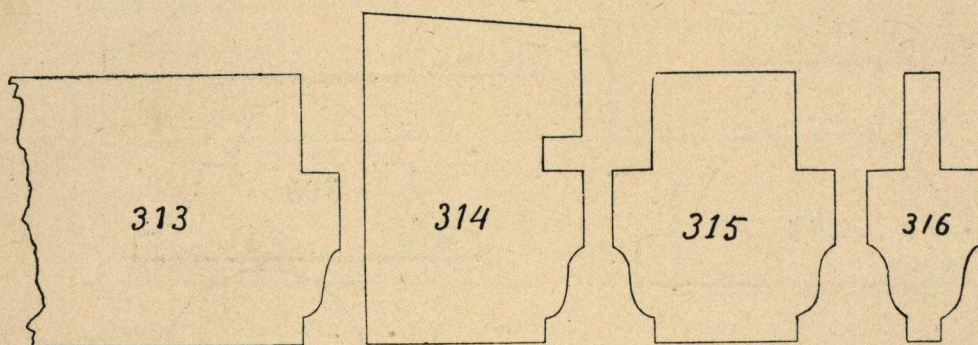
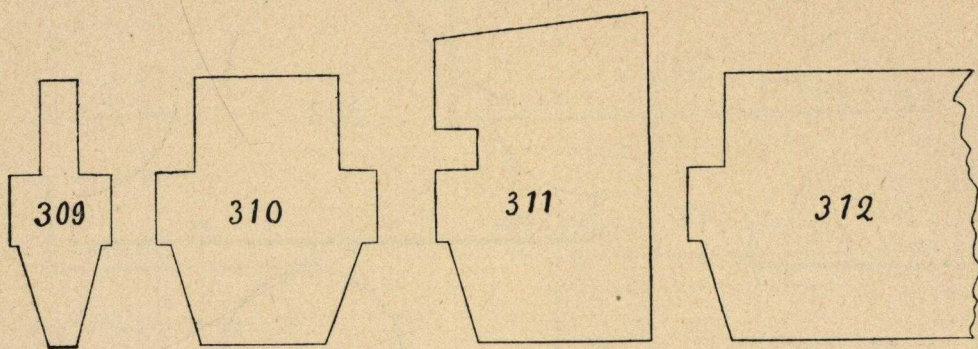
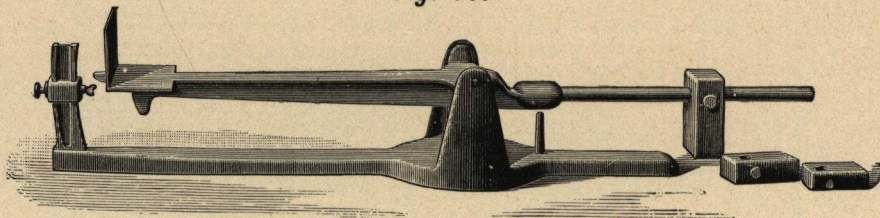


Fig. 10.



SEYMOUR'S PROPORTIONAL SCALE.

PRICE, - \$15.00.

Fig. 11.

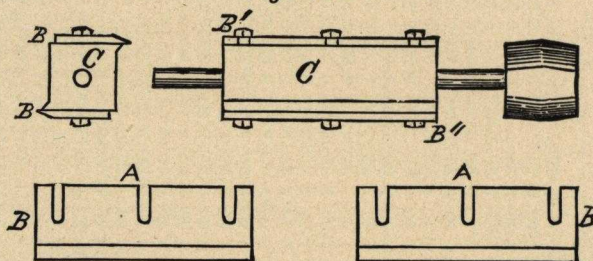
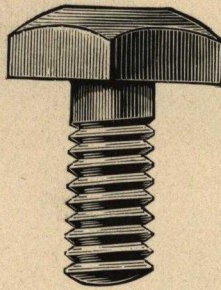


Fig. 10 represents a Proportional Scale for balancing moulding knives, planer knives, revolving cutters of whatever shape, knife capscrews, etc. To explain the reasons for its use, let A. A. Fig. 11, represent two knives which are to be fastened onto the cutter head C. Let it be supposed that the knives are of the same specific weight, but that there is an excess of weight at the opposite ends, B B; then when revolving on the head, they will cause a violent jarring or "throwing," by reason of the excess at B, ' and at B." The knives could be reduced to the same specific weight by the aid of common grocers' scales, but that would not attain the object. By the use of the Proportional Scale the position as well as the amount of excess of weight can be ascertained; so that in reducing the knives to the same specific weight they may be made to agree in their corresponding parts. The method hitherto used, is by reducing pairs or sets of knives to the same dimensions, and by aid of common scales to the same specific weight; but so great are the differences in the density of the parts of even the same knife, that a still running set of knives is but an accidental result.

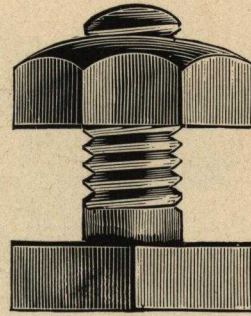
MANIPULATION OF THE PROPORTIONAL SCALE.

Let it be supposed that two or more knives are intended to be fastened onto one cutter-head, rotating at a high velocity; and that it be conceded that they must not only be of the same specific weight, but must agree in their corresponding parts. Place each knife in succession on the platform of the scales with its face towards the end-board A, with a suitable weight at the opposite end of the beam. If by this test they all appear to be of the same specific weight, place them each in succession again, with their backs against the end-board A. They may still appear to be of the same specific weight. Then place them each in succession flatwise on the platform, in as many different positions as of which they are susceptible, noting and reducing by an indefinite number of trials, the edges which are found to be of excessive weight, until they are reduced to the same weight in their corresponding parts. They will also then, of course, be of the same specific weight.

The balance weights, B B, are made oblong, so that by putting the heavy end up, the entire mass, consisting of weight beam and knife, may be poised near its centre of gravity, and thereby oscillate more sensitively. If, however, the objects to be balanced be very heavy, the weight must hang down, or the upper portion of the mass may preponderate. It will be seen that the operator can make the poise more or less delicate, according to the varied positions of the knives to be balanced.



Cutter Head Screw.



Cutter Head Bolt & Nut.

STEEL BOLTS AND SCREWS.

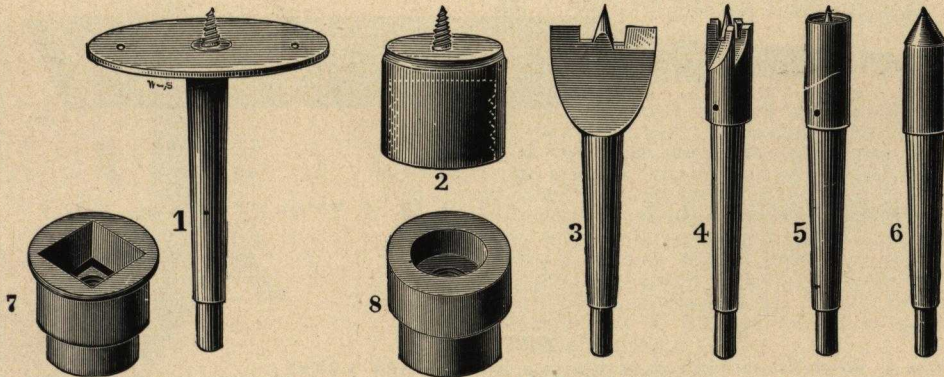
FOR PLANER CYLINDERS AND CUTTER HEADS.

These Bolts and Screws are made of a tough grade of steel, especially adapted for the purpose.

One-half and five-eighth inch Bolts, with nuts ready for use, and the same size Screw blanks all turned ready for cutting, kept in stock at all times, from which orders can be filled promptly.

In ordering Bolts and nuts, give the size and length. In ordering Screws, always send a sample Screw, so that we may be sure of the exact size.

Price, $\frac{1}{2}$ inch Bolt and Nut, each,	-	-	-	-	-	-	-	-	\$.40
" $\frac{5}{8}$ " " " " "	-	-	-	-	-	-	-	-	.50
" $\frac{1}{2}$ " " " " " Screw, "	-	-	-	-	-	-	-	-	.30
" $\frac{5}{8}$ " " " " " " " "	-	-	-	-	-	-	-	-	.40

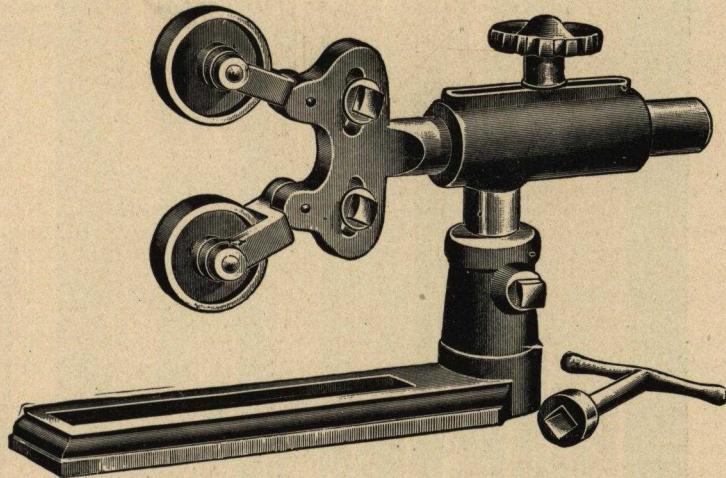


LATHE TOOLS.

Price, No. 1 Screw Face Plate,	-	-	-	-	-	-	-	-	\$ 3 00
" " 2 Rosette Chuck,	-	-	-	-	-	-	-	-	3 00
" " 3 Flat Driver,	-	-	-	-	-	-	-	-	1 50
" " 4 Five Point Driver,	-	-	-	-	-	-	-	-	1 50
" " 5 Cup Tail Center,	-	-	-	-	-	-	-	-	1 50
" " 6 Cone Center,	-	-	-	-	-	-	-	-	1 00
" " 7 Square Hollow Chuck,	-	-	-	-	-	-	-	-	3 00
" " 8 Round " "	-	-	-	-	-	-	-	-	3 00

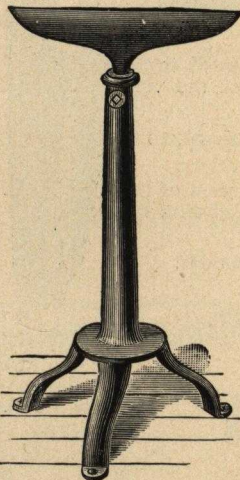
In ordering, turn a piece of wood to fit the Spindle and send it. If for a Lathe of our manufacture, give the swing of the Lathe and we will insure a fit.

IMPROVED BACK REST.



The above cut represents the Latest Improved Back Rest for use on wood turning lathes. It is the only Back Rest that can be operated successfully with one hand. It is perfectly adapted to the lightest and heaviest work brought out by a practical wood turner.

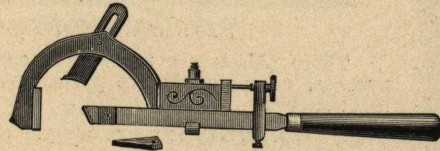
Price.....\$10 00



FLOOR REST STAND.

For Wood Turning Lathes.

Price, \$10.00.



CHISEL CALIPERS FOR HAND TURNING.

The hand tool illustrated above is intended for use with the common turning Lathe. It combines the offices of the calipers with the chisel, and not only greatly facilitates the work, but renders its execution more perfect than can be accomplished by means of the ordinary tools. It is made to receive cutters of various forms for calipering in the angle on the mills or on any portion of the pattern desired.

By applying a suitable shaped knife and properly adjusting the guide attached to the arch, it is adapted to turning Dowel rods, chair stretchers, shade rollers, etc. In this manner rods may be finished from $\frac{3}{8}$ to $2\frac{1}{4}$ inches in diameter, smooth and true.

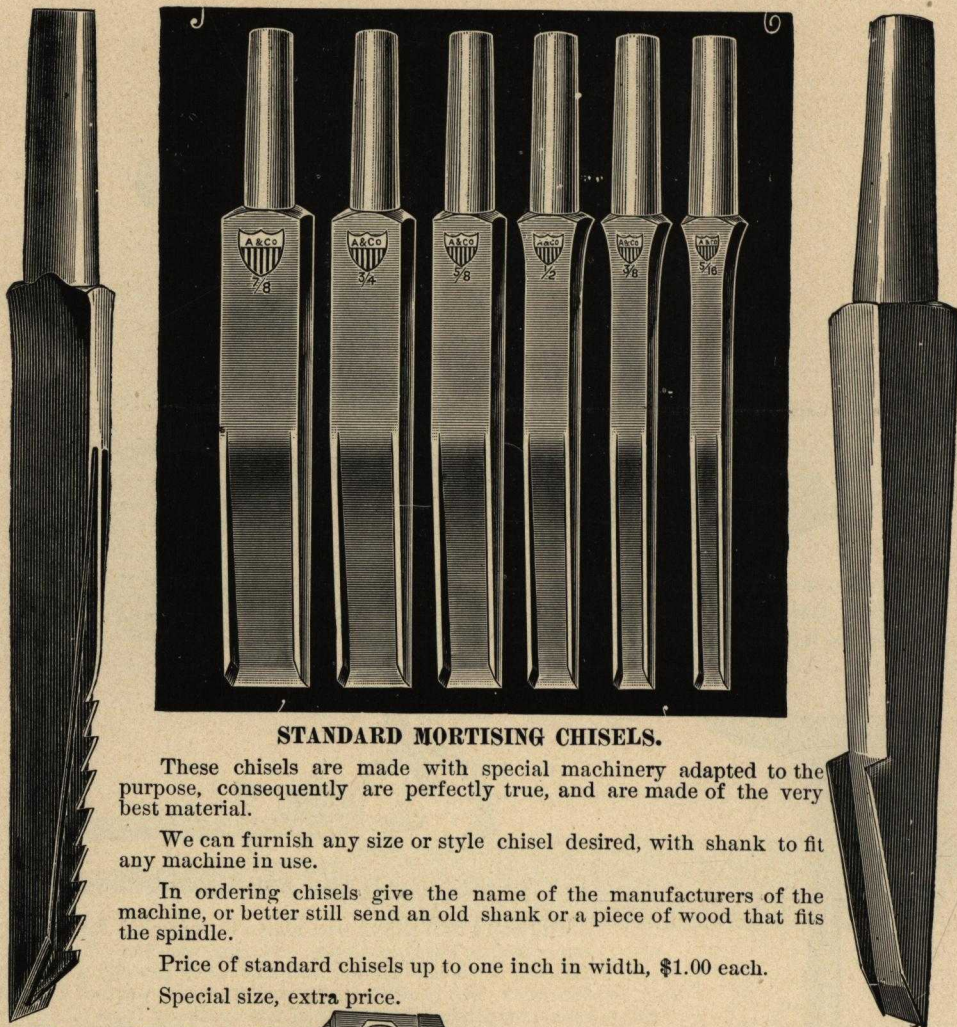
A clamp and tangent or micrometer screw is applied by means of which the finest nicety of adjustment may be obtained if desired. The length of the tool from the cutting edge to the end of the handle is about 14 inches.

Price.....\$4.00.

BABBITT LADLE.



Price50 cents.



STANDARD MORTISING CHISELS.

These chisels are made with special machinery adapted to the purpose, consequently are perfectly true, and are made of the very best material.

We can furnish any size or style chisel desired, with shank to fit any machine in use.

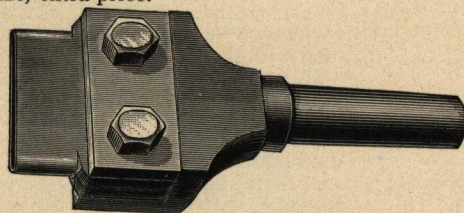
In ordering chisels give the name of the manufacturers of the machine, or better still send an old shank or a piece of wood that fits the spindle.

Price of standard chisels up to one inch in width, \$1.00 each.

Special size, extra price.

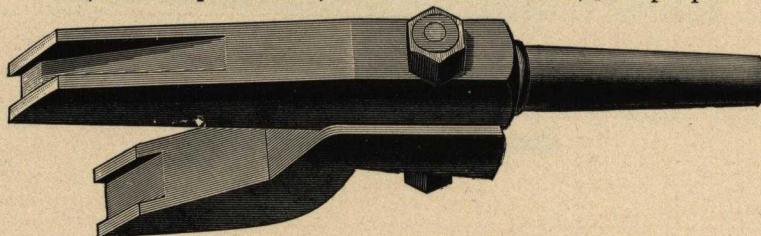
Cole' Patent Chisel.

Price of all widths up to 1 inch, \$1.50.
Special size extra price.



BLIND SLAT CHISEL.

Price, with one pair Cutters, \$5.00. Extra Cutters, \$2.00 per pair.



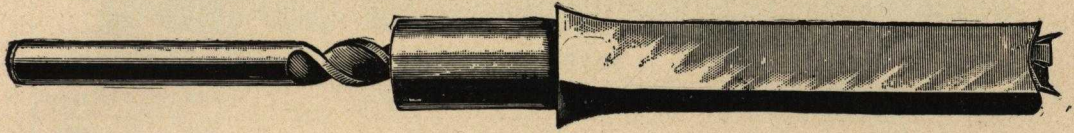
PULLEY STILE MORTISING CHISEL.

Made to fit any size of pulleys desired. Price \$5.00.

Lip Chisels.

Price of all widths up to 1 inch, \$1.25.
Special size extra price.

HOLLOW CHISELS AND BITS.



In calling the attention of wood workers to these valuable tools, we desire to state a few facts regarding them. They are warranted to stand more strain and wear than any Chisel made. Owing to the construction of their interior, they are not liable to choke up, but deliver the chips out of the end of Chisel, thus rendering it unnecessary to cut away the body of Chisel, leaving it much stronger, and more in length for wear. By a recent improvement only one-half the number of Chisels are required to do the work formerly done, thus making a saving of 50 per cent. on outfit for car works.

We keep in stock the square Chisel, to fit the Greenlee Mortiser $\frac{1}{4}$ to 2 inches, and make to order on short notice the "Combination" from $\frac{3}{8} \times \frac{1}{2}$ to $1\frac{1}{2} \times 2$ inch. Bits furnished with Chisels at manufacturers prices, freight added.

These "Combination Chisels" will cut two size mortises, either with or across the grain. They vary by eighths of an inch, say, $\frac{1}{2} \times \frac{3}{8}$, $\frac{3}{8} \times \frac{1}{2}$, $\frac{1}{2} \times \frac{1}{2}$, $\frac{3}{4} \times 1$ inch, and so on to any size desired.

SPECIAL PRICE LIST TO CAR BUILDERS.

HOLLOW CHISELS.

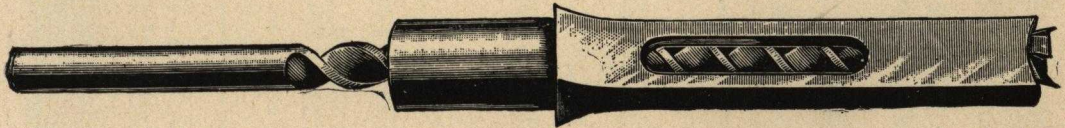
3 $\frac{1}{4}$ Inches Long.		6 Inches Long.			
$\frac{3}{8}$ inch at \$3 28 each		$\frac{3}{8}$ inch at \$6 61 each	$1\frac{1}{8}$ inch at \$13 28 each	$2\frac{1}{8}$ inch at \$21 05 each	
" " 3 83 "		" " 7 73 "	$1\frac{1}{2}$ " " 14 39 "	$2\frac{3}{8}$ " " 22 17 "	
$\frac{1}{2}$ " " 4 94 "		" " 8 83 "	$1\frac{3}{8}$ " " 15 50 "	$2\frac{1}{2}$ " " 23 28 "	
$\frac{5}{8}$ " " 5 50 "		1 " " 9 94 "	$1\frac{5}{8}$ " " 16 61 "	$2\frac{5}{8}$ " " 24 39 "	
		$1\frac{1}{8}$ " " 11 06 "	$1\frac{7}{8}$ " " 17 72 "	$2\frac{7}{8}$ " " 25 50 "	
		$1\frac{1}{4}$ " " 12 17 "	2 " " 18 83 "	3 " " 26 61 "	
			$2\frac{1}{8}$ " " 19 94 "	$3\frac{1}{8}$ " " 27 72 "	

Ten per cent. added for each additional inch in length.

Combination Chisels same price as others by largest measurement.

Bit list as follows: $\frac{1}{4}$ to $\frac{7}{8}$ \$9 00 per dozen.
 $\frac{1}{2}$ inch and up 50 cents per quarter inch.

SPECIAL PRICE LIST FOR SASH, DOOR AND BLIND FACTORIES.



HOLLOW CHISELS.

$\frac{1}{4} \times \frac{1}{4}$ at.....\$3 28 each	$\frac{1}{4} \times \frac{1}{2}$ " 3 28 "	$\frac{7}{8} \times \frac{3}{8}$ at.....\$4 39 each	$\frac{1}{2} \times \frac{3}{4}$ " 4 94 "
$\frac{1}{4} \times \frac{5}{8}$ " 3 28 "	$\frac{3}{8} \times \frac{9}{16}$ " 3 28 "	$\frac{1}{2} \times \frac{1}{2}$ " 3 83 "	$\frac{9}{16} \times \frac{1}{6}$ " 4 94 "
$\frac{1}{6} \times \frac{9}{16}$ " 3 28 "	$\frac{1}{6} \times \frac{1}{8}$ " 3 83 "	$\frac{1}{2} \times \frac{9}{16}$ " 4 39 "	$\frac{3}{8} \times \frac{3}{8}$ " 4 94 "
$\frac{1}{6} \times \frac{1}{2}$ " 3 28 "	$\frac{1}{6} \times \frac{1}{2}$ " 3 83 "	$\frac{1}{2} \times \frac{3}{8}$ " 4 94 "	$\frac{3}{8} \times \frac{1}{2}$ " 5 50 "
$\frac{1}{6} \times \frac{1}{2}$ " 3 28 "	$\frac{1}{6} \times \frac{9}{16}$ " 3 83 "	$\frac{1}{2} \times \frac{1}{6}$ " 4 94 "	$\frac{1}{2} \times \frac{1}{4}$ " 5 50 "
$\frac{1}{6} \times \frac{7}{8}$ " 3 28 "			

Ten per cent. added for each additional inch in length.

Combination Chisels same price as others by larger measurement.

Bit list as follows: $\frac{1}{4}$ to $\frac{7}{8}$ \$9 00 per dozen,
 $\frac{1}{2}$ inch and up 50 cents per quarter inch.

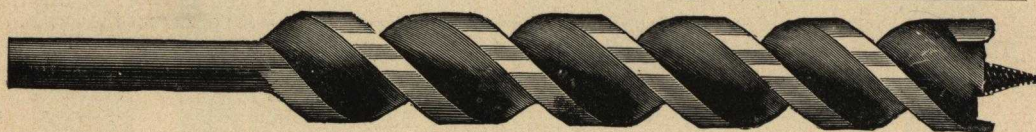
DIRECTIONS FOR ORDERING.

In ordering Chisels give size, length from point to shoulder and size of shank. With or without opening in side. In ordering Bits for other Chisels it is best to send sample Chisel, as the same size Bits do not fit all Chisels. Give length of twist, length over all, and size of shank. Be particular in making out orders so that there can be no mistakes.



MACHINE BITS.

SIZE.	Twist, 2 to 6 in. long.		SIZE.	Twist, 2 to 6 in. long.		SIZE.	Twist, 2 to 6 in. long.	
	Doz.	Each.		Doz.	Each.		Doz.	Each.
3-16	\$5 10	\$0 47	12-16	\$9 90	\$0 91	21-16	\$18 00	\$1 65
4-16	5 10	47	13-16	10 80	1 00	22-16	18 90	1 75
5-16	5 10	47	14-16	11 70	1 07	23-16	19 80	1 82
6-16	5 70	53	15-16	12 60	1 15	24-16	20 70	1 90
7-16	6 60	60	16-16	13 50	1 25	26-16	22 50	2 07
8-16	7 20	66	17-16	14 40	1 32	28-16	24 30	2 23
9-16	7 80	72	18-16	15 30	1 40	30-16	26 10	2 40
10-16	8 40	77	19-16	16 20	1 48	32-16	27 90	2 67
11-16	9 15	85	20-16	17 10	1 57			



CHUCK BITS.

Size.	Length of Twist. Inches.	Length of Shank. Inches.	Diameter of Shank. Inches.	Price Per Doz.
4-16	4	2½	7-32	\$ 4 50
5-16	4	2½	7-32	4 75
6-16	4	2½	9-32	5 00
7-16	4½	2½	9-32	5 25
8-16	4½	2½	9-32	5 50
9-16	4½	2½	9-32	6 25
10-16	4½	2½	5-16	7 00
11-16	5	2½	5-16	7 75
12-16	5	2½	5-16	8 50
13-16	5	2½	11-32	9 50
14-16	5	2½	11-32	10 50
15-16	5	2½	11-32	11 50
16-16	5	2½	11-32	12 50
17-16	6	2½	3-8	13 50
18-16	6	2½	3-8	14 50
19-16	6	2½	3-8	15 50
20-16	6	2½	3-8	16 50
22-16	6	2½	13-32	18 50
24-16	6	2½	13-32	21 00
26-16	6	2½	13-32	24 00
28-16	6	2½	13-32	27 00
30-16	6	2½	13-32	30 00
32-16	6	2½	13-32	33 00

DOWEL BITS.

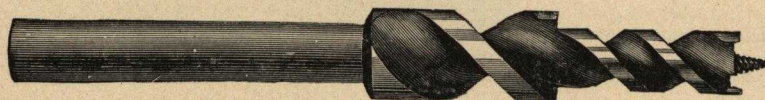
Diameter, Inches..	1-4,	5-16,	6-16,	7-16,	8-16,	9-16,	10-16,	12-16,
Per Dozen	\$3.00	3.40	3.80	4.40	4.80	5.20	5.60	6.60
Each.....	.35	.35	.40	.45	.50	.55	.60	.65



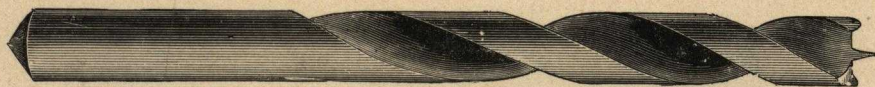
SPOON BITS.

\$3 to \$9 per doz. according to size and style.

COUNTER SINK BITS.



The price of the two cuts added together.



STRAIGHT SHANK DRILL BITS.

FOR WOOD WORK.

Diameter, inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{1}{2}$
Length.....	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5	5 $\frac{1}{4}$	5 $\frac{1}{2}$	5 $\frac{3}{4}$
Each	\$0.30	0.40	0.45	0.50	0.55	0.65	0.70	0.75	0.80
Diameter, inches	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$
Length.....	6	6 $\frac{1}{4}$	6 $\frac{1}{2}$	7	7 $\frac{1}{2}$	7 $\frac{1}{4}$	8	8 $\frac{1}{4}$	8 $\frac{1}{2}$
Each.....	\$0.85	1.00	1.15	1.35	1.65	1.90	2.20	2.50	2.80

Parties ordering Drill Bits will please state whether with Drill or Brad Point.

STRAIGHT SHANK DRILLS.

No. 111 $\frac{1}{2}$			No. 105.			
Shanks 2 $\frac{1}{2}$ in. long and $\frac{1}{2}$ inch in diameter.			Jobbers' and Machinists' Sets.			
Diameter.	Length, in Inches.	Each.	Diameter.	Length.	Price, per Dozen.	Price, each.
1-8	6	\$ 45	1-16	2 $\frac{1}{2}$	\$ 1 00	\$ 09
5-32	6	48	5-64	2 $\frac{3}{8}$	1 10	10
3-16	6	50	3-32	2 $\frac{3}{8}$	1 20	11
7-32	6	55	7-64	2 $\frac{7}{8}$	1 30	12
1-4	6	60	1-8	3	1 45	13
9-32	6	65	9-64	3 $\frac{1}{2}$	1 60	15
5-16	6	70	5-32	3 $\frac{1}{4}$	1 80	16
11-32	6	73	11-64	3 $\frac{3}{8}$	2 00	18
3-8	6	75	3-16	3 $\frac{1}{2}$	2 20	20
13-32	6	78	13-64	3 $\frac{3}{8}$	2 40	21
7-16	6	80	7-32	3 $\frac{3}{4}$	2 65	23
15-32	6	83	15-64	3 $\frac{7}{8}$	2 90	26
1-2	6	85	1-4	4	3 15	28
17-32	6	88	17-64	4 $\frac{1}{8}$	3 40	30
9-16	6	90	9-32	4 $\frac{1}{4}$	3 65	32
19-32	6	1 00	19-64	4 $\frac{3}{8}$	3 90	35
5-8	6	1 05	5-16	4 $\frac{1}{2}$	4 20	37
21-32	6	1 10	21-64	4 $\frac{3}{4}$	4 50	40
11-16	6	1 15	11-32	4 $\frac{3}{4}$	4 80	42
23-32	6	1 20	23-64	4 $\frac{7}{8}$	5 10	45
3-4	6	1 25	3-8	5	5 40	48
25-32	6	1 30	25-64	5 $\frac{1}{2}$	5 70	50
13-16	6	1 35	13-32	5 $\frac{1}{4}$	6 00	53
27-32	6	1 40	27-64	5 $\frac{3}{8}$	6 40	55
7-8	6	1 45	7-16	5 $\frac{1}{2}$	6 80	59
29-32	6	1 55	29-64	5 $\frac{3}{4}$	7 20	63
15-16	5	1 60	15-32	5 $\frac{3}{4}$	7 50	65
31-32	6	1 70	31-64	5 $\frac{7}{8}$	7 75	67
1	6	1 80	1-2	6	8 00	70
1 1-16	6	2 00				
1 1-8	6	2 20				

BORING BIT.



Patented February 11th, 1890.

The above cut represents our new patent Boring Bit, which upon trial will be found superior to any boring bit in the market. In bringing this boring bit before the public we feel sure that we have filled a long felt want.

These boring bits are made of the best tool steel, and are tempered the entire length; they are turned true to size and can be used up to the shank, they have a loose center with screw point, which can be taken out and the bit sharpened, when the screw point may be replaced, which makes the bit ready for use. If this screw point breaks off it can be taken out and a new one put in at a very small cost, which makes the bit as good as ever.

Every wood worker can see at once the superior advantages it has over the solid screw point boring bit; the above bit is calculated for boring sideways, and will be found a very useful bit for boring dowell holes. These bits are made $4\frac{1}{2}$ inches long, shanks are made $1\frac{1}{2}$ inches long and $\frac{1}{2}$ inch in diameter.

PRICE OF BORING BITS;

Size.	Price.	Size.	Price.
$\frac{5}{16}$	\$1.25	$\frac{5}{8}$	\$1.75
$\frac{3}{8}$	1.25	$\frac{11}{16}$	1.75
$\frac{7}{16}$	1.25	$\frac{3}{4}$	2.00
$\frac{1}{2}$	1.25	$\frac{7}{8}$	2.25
$\frac{9}{16}$	1.50	1.....	2.50

COUNTERSINK BORING BIT.



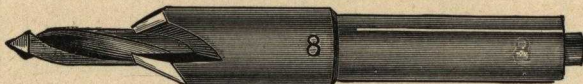
In presenting above cut we wish to call your attention to our new patent Combined Boring Bit and Countersink. The cut, No. 5, represents our adjustable countersink, which will be found superior to any countersink in the market.

This countersink has a drill running through the center the entire length, which can be adjusted as desired; the drill is held in countersink at the shank, which is slotted as the set screw is tightened down on shank to hold countersink in machine; it at the same time presses the slotted shank together, which holds the drill firmly. These countersinks are made of best tool steel, they are all turned perfectly true to standard sizes and the spiral flutes are milled, not twisted. They are tempered the entire length and can be used up to the shank, the small drill can be replaced at small cost, should one break. These countersinks are made with a $\frac{1}{2}$ inch shank, $1\frac{1}{2}$ inches long, length of countersink $4\frac{1}{2}$ inches, total length of countersink and drill 6 inches.

PRICE OF COUNTERSINKS WITH $\frac{3}{16}$, $\frac{7}{32}$ OR $\frac{1}{4}$ DRILLS.

Diameter.	Price.	Diameter.	Price.
$\frac{7}{16}$	\$1.50	$\frac{9}{16}$	\$1.50
$\frac{1}{2}$	1.50	$\frac{5}{8}$	1.75

TAPER COUNTERSINK.

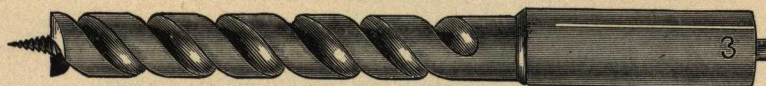


Patented February 11th, 1890.

This countersink is made to countersink for screwheads. The drill runs the entire length and can be adjusted as desired. The shank is slotted to hold drill, the same as countersink No. 5, described above.

Price, with $\frac{3}{16}$, $\frac{7}{32}$ or $\frac{1}{4}$ drills, \$1.50. Total length $4\frac{1}{2}$ inches, the shank is made $1\frac{1}{2}$ in. long and $\frac{1}{2}$ inch in diameter.

END BORING BIT.



Patented February 11th, 1890.

The above cut represents our patent Boring Bit for boring end ways of timber. This made on the same principle as our Boring Bit No. 7 described elsewhere.

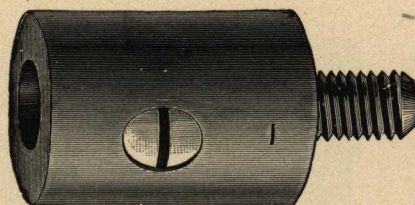
It will be found an excellent bit for boring endways, having a sharper twist and no lips, which insure a perfect cutting bit for the purpose intended. The shanks are $1\frac{1}{2}$ inches long and $\frac{1}{2}$ inch in diameter.

We furnish with every dozen bits one chuck free of charge to fit the Pryible Boring Machine. See cut No. 1 below.

PRICE OF BORING BITS.

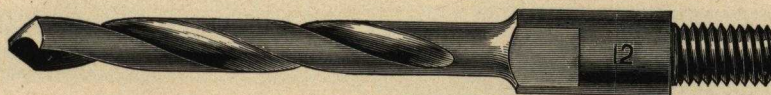
Size.	Price.	Size.	Price.
$\frac{5}{16}$	\$1 25	$\frac{1}{8}$	\$1 75
$\frac{3}{8}$	1 25	$\frac{1}{16}$	1 75
$\frac{7}{16}$	1 25	$\frac{3}{4}$	2 00
$\frac{1}{2}$	1 25	$\frac{7}{8}$	2 25
$\frac{9}{16}$	1 50	1.....	2 50

CHUCK FOR PRYIBLE BORING MACHINE.



Price..... \$1 50

SCREW SHANK DRILL BIT FOR PRYIBLE BORING MACHINE.



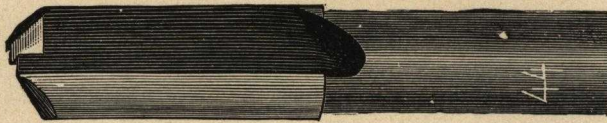
These Drill Bits are milled suitable for boring wood and are superior to the twist drill.

Diameter.	Length.	Price per Dozen.
$\frac{1}{4}$	$4\frac{1}{2}$	\$6 60
$\frac{5}{16}$	$4\frac{1}{2}$	7 80
$\frac{3}{8}$	$4\frac{1}{2}$	8 40
$\frac{7}{16}$	$4\frac{1}{2}$	9 60
$\frac{1}{2}$	$4\frac{1}{2}$	10 80

PLUG CUTTER.

This cutter is for cutting wooden plugs for plugging screw heads. It is the best plug cutter in the market, and is made to fit our combined countersink and boring bits.

Sizes.	Price.
$\frac{5}{8}$	\$1.25
$\frac{7}{16}$	1.40
$\frac{1}{2}$	1.50
$\frac{9}{16}$	1.75
$\frac{5}{8}$	2.00

ROUTER BITS.

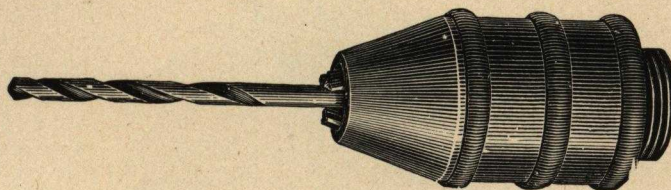
These bits are made from the best tool steel, made expressly for us by the Crescent Steel Co., and we warrant them to be perfect. The shanks are made $1\frac{1}{2}$ inches long by $\frac{1}{2}$ inch diameter.

Diameter of Bit.	Price per Dozen.
$\frac{1}{4}$	\$ 5.40
$\frac{5}{16}$	5.40
$\frac{3}{8}$	6.00
$\frac{7}{16}$	7.20
$\frac{1}{2}$	8.46
$\frac{9}{16}$	10.80
$\frac{5}{8}$	12.00
$\frac{3}{4}$	13.80
$\frac{7}{8}$	15.60
1	18.00

VIBRATING MORTISE BIT.

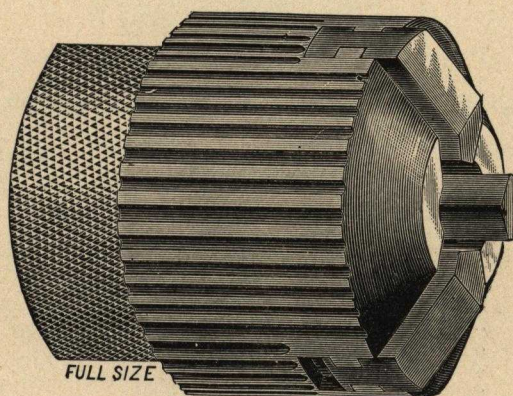
These bits are made from the best Crescent special drill rod, and are warranted to be superior to any vibrating mortise bit in the market. The shanks are 2 inches long by $\frac{1}{2}$ inch diameter.

Diameter.	Price per Dozen.
$\frac{5}{16}$	\$9.00
$\frac{3}{8}$	9.00
$\frac{7}{16}$	9.00
$\frac{1}{2}$	9.00



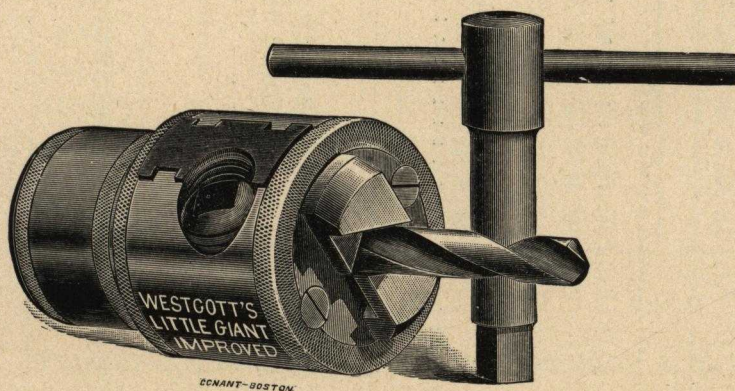
BEACH PATENT DRILL CHUCK.

Holds from $\frac{1}{16}$ to $\frac{1}{2}$ \$10 00



CUSHMAN DRILL CHUCK.

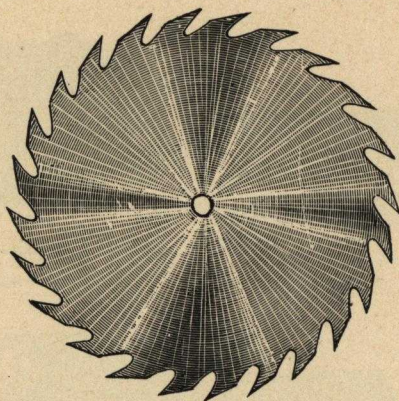
Takes from 0 to $\frac{3}{8}$ \$4 00



LITTLE GIANT IMPROVED DRILL CHUCK.

Price List.

No.	Diameter.	Holding Drills.	Price.
0	2 $\frac{1}{4}$ inch.	0 to $\frac{1}{2}$ inch.	\$ 8 00
1	2 $\frac{1}{2}$ "	0 to $\frac{3}{8}$ "	9 00
2	3 $\frac{1}{2}$ "	0 to 1 "	10 00
2 $\frac{1}{2}$	4 "	0 to 1 inch, extra strong.	11 00
3	6 "	0 to 1 $\frac{1}{2}$ inch.	18 00
4	6 $\frac{1}{2}$ "	0 to 2 "	20 00



PATENT GROUND AND TEMPERED SOLID CIRCULAR SAWS.

Diameter.	Thickness.	Size of Hole.	PRICE, EACH.	Extra for each additional Gauge. [heavier]	Price for beveling extra, each Gauge
4 inches.	19 gauge.	$\frac{3}{8}$ inch.	\$1.00	\$.03	\$.14
5 "	19 "	$\frac{3}{8}$ "	1.20	.04	.16
6 "	18 "	$\frac{3}{8}$ "	1.40	.05	.18
7 "	18 "	$\frac{3}{8}$ "	1.70	.06	.20
8 "	18 "	$\frac{3}{8}$ "	2.00	.08	.22
9 "	17 "	$\frac{3}{8}$ "	2.50	.10	.25
10 "	16 "	$\frac{3}{8}$ "	3.00	.12	.28
11 "	16 "	1 "	3.50	.14	.30
12 "	15 "	1 "	3.75	.17	.35
14 "	15 "	$1\frac{1}{8}$ "	4.50	.21	.40
16 "	14 "	$1\frac{1}{8}$ "	5.50	.25	.50
18 "	13 "	$1\frac{1}{8}$ "	7.00	.30	.60
20 "	13 "	$1\frac{1}{8}$ "	8.50	.35	.70
22 "	12 "	$1\frac{1}{8}$ "	10.00	.45	.80
24 "	11 "	$1\frac{1}{8}$ "	12.00	.55	.90
26 "	11 "	$1\frac{3}{8}$ "	14.50	.65	1.05
28 "	10 "	$1\frac{3}{8}$ "	16.00	.80	1.20
30 "	10 "	$1\frac{1}{2}$ "	18.00	.90	1.30
32 "	10 "	$1\frac{1}{2}$ "	20.00	1.00	1.40
34 "	9 "	$1\frac{1}{2}$ "	22.50	1.20	1.55
36 "	9 "	$1\frac{1}{2}$ "	25.50	1.40	1.70
38 "	9 "	$1\frac{1}{2}$ "	30.00	1.75	1.85
40 "	9 "	2 "	35.00	2.00	2.00
42 "	8 "	2 "	42.00	2.50	2.20
44 "	8 "	2 "	50.00	3.00	2.40
46 "	8 "	2 "	60.00	3.50	2.60
48 "	8 "	2 "	70.00	4.00	2.80
50 "	7 "	2 "	80.00	4.50	3.00
52 "	7 "	2 "	90.00	5.00	3.25
54 "	7 "	2 "	100.00	6.00	3.50
56 "	7 "	2 "	115.00	7.00	3.75
58 "	7 "	2 "	130.00	8.00	4.05
60 "	6 "	2 "	145.00	9.00	4.35
62 "	6 "	2 "	160.00	10.00	4.65
64 "	6 "	2 "	180.00	12.00	5.00
66 "	6 "	2 "	200.00	15.00	5.35
68 "	5 "	2 "	225.00	18.00	5.75
70 "	5 "	2 "	255.00	21.00	6.15
72 "	5 "	2 "	290.00	24.00	6.55
74 "	5 "	2 "	330.00	27.00	7.00
76 "	5 "	2 "	375.00	30.00	7.50

Circular Saws to cut metal or ivory, 50 per cent advance. No extra charge for saws one gauge thicker than list. Circular Saws beveled one gauge without extra charge up to 44 inches. 44 inches and larger, beveled two gauges without extra charge.

Inserted Tooth Saws of any size furnished to order at Manufacturers prices.

GROOVING SAWS.

Thickness.	$\frac{1}{4}$	3-16	$\frac{1}{2}$	5-16	$\frac{3}{8}$	7-16	$\frac{1}{2}$
4 inch diameter.. . . .	\$ 1 20	\$ 1 40	\$1 60	\$2 50	\$3 50	\$4 50	\$5 50 ea.
5 " 	1 55	1 75	2 10	3 00	4 00	5 00	6 00 "
6 " 	1 90	2 20	2 70	3 50	4 50	5 50	6 50 "
7 " 	2 30	2 70	3 30	4 00	5 00	6 00	7 00 "
8 " 	2 70	3 20	3 90	4 75	5 75	6 75	7 75 "
9 " 	3 30	3 75	4 50	5 25	6 25	7 25	8 25 "
10 " 	3 90	4 50	5 10	6 00	7 00	8 00	9 00 "
11 " 	4 50	5 10	5 70	6 50	7 50	8 50	9 50 "
12 " 	5 10	5 70	6 25	7 50	8 50	9 50	10 50 "
Space of Teeth.....	$\frac{1}{2}$ in.	1 in.	1 in.	1 $\frac{1}{2}$ in	1 $\frac{1}{2}$ in.	1 $\frac{1}{2}$ in	2 in.

Saws with less space or special teeth, extra price.

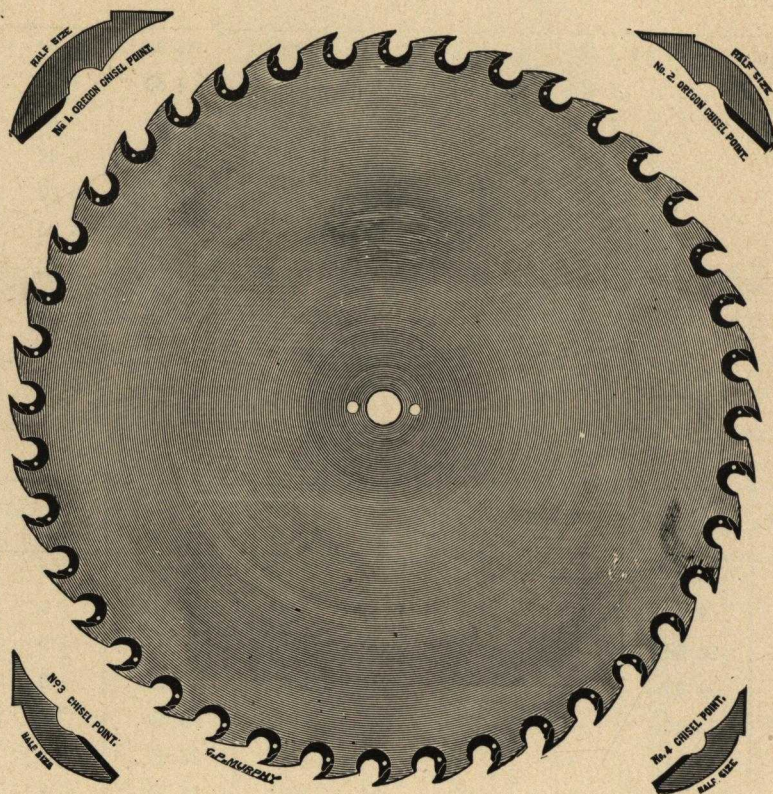
RE-SAWING SAWS.

Diameter inches.	Price each.	Guage at Centre.	Guage at Rim.	Diameter inches.	Price each.	Guage at Centre.	Guage at Rim.
18	\$8 80	12	13	28	\$ 19 60	10	14
18	9 10	11	15	28	20 80	9	14
20	10 60	12	16	30	21 90	9	13
20	10 95	11	15	30	23 20	9	14
22	12 40	11	15	32	24 20	9	13
22	12 85	10	14	32	25 60	9	14
24	14 70	10	14	34	28 70	8	13
24	15 60	10	15	34	30 25	8	14
26	17 65	10	14	36	32 30	8	13
26	18 70	10	15	36	34 00	8	14

PRICES FOR SETTING AND SHARPENING CIRCULAR SAWS.

To 20 inches.....	5 cents per inch in diameter
" 30 " 	6 " " "
" 40 " 	7 " " "
" 50 " 	8 " " "
" 60 " 	9 " " "
" 72 " 	10 " " "

PATENT CHISEL-POINT CIRCULAR SAW.



For price, see page 381

Duplicate Points, Nos. 3 and 4, \$5.00 per 100.

Duplicate Points, Oregon tooth, Nos. 1 and 2, \$6.00 per 100.

Duplicate Holders, Nos. 3 and 4, 45 cents each.

Duplicate Holders, Oregon, Nos. 1 and 2, 55 cents each.

Old saws altered to chisel-point saws at half price of solid-tooth saws of their size, and \$1.50 for each tooth inserted of Nos. 3 and 4, and \$1.75 of Oregon Nos. 1 and 2.

Old saws are reduced in diameter from 2 to 3½ inches in altering.

Saws beveled one gauge, no extra charge. Saws one gauge heavier than list, no extra charge.

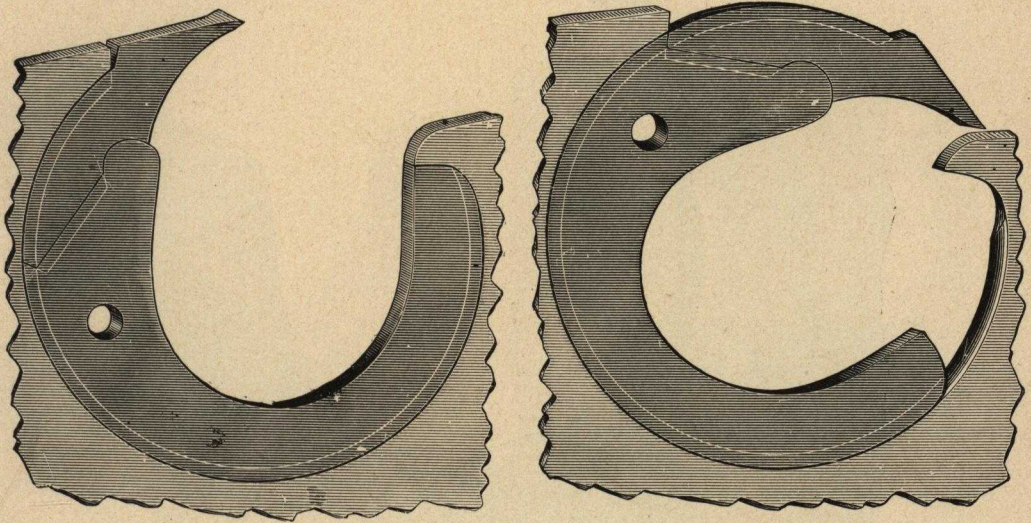
Saws 44 inches, and larger, beveled two gauges without extra charge.

From two to six extra holders given with each saw, according to size.

Ten sets of extra Points given with each saw, whether new or altered from a solid tooth.

PATENT CHISEL POINT CIRCULAR SAW.

Patented September 28, 1869; October 4, 1870.



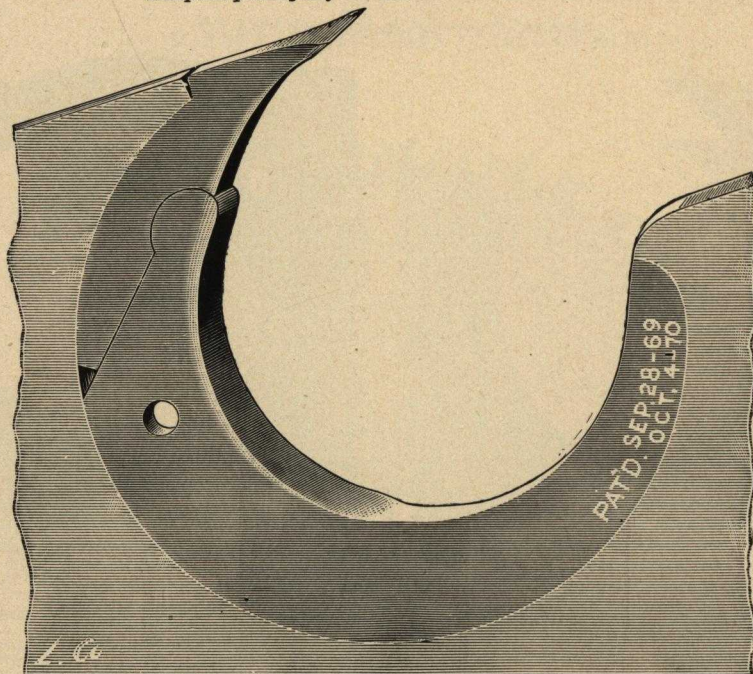
Diameter.	Thickness.	No. of Teeth.	Size of Hole.	Price Each.	Extra for each additional Gauge (heavier)	Price for beveling new saws (grinding or beveling old saws extra).
12 inches,	11 gauge,	10	.....	\$ 17 00	\$ 0 17	\$0 35
14 "	11 "	10	.....	19 00	21	40
16 "	11 "	12	.....	22 00	25	50
18 "	11 "	14	1 1/4 in.	25 00	30	60
20 "	11 "	14	1 5/16 "	30 00	35	70
22 "	11 "	16	1 1/8 "	35 00	45	80
24 "	11 "	18	1 1/2 "	40 00	55	90
26 "	10 "	18	1 1/2 "	45 00	65	1 05
28 "	10 "	20	1 1/2 "	50 00	80	1 20
30 "	10 "	20	1 1/2 "	55 00	90	1 30
32 "	9 "	22	1 1/2 "	60 00	1 00	1 40
34 "	9 "	22	1 1/2 "	66 00	1 20	1 55
36 "	8 "	24	1 1/2 "	72 00	1 40	1 70
38 "	8 "	24	1 1/2 "	78 00	1 75	1 85
40 "	8 "	26	2 "	84 00	2 00	2 00
42 "	8 "	28	2 "	90 00	2 50	2 20
44 "	7 "	30	2 "	97 00	3 00	2 40
46 "	7 "	30	2 "	105 00	3 50	2 60
48 "	7 "	32	2 "	115 00	4 00	2 80
50 "	7 "	34	2 "	130 00	4 50	3 00
52 "	6 "	36	2 "	150 00	5 00	3 25
54 "	6 "	38	2 "	175 00	6 00	3 50
56 "	6 "	40	2 "	200 00	7 00	3 75
58 "	6 "	42	2 "	225 00	8 00	4 05
60 "	5 "	42	2 "	255 00	9 00	4 35
62 "	5 "	44	2 "	290 00	10 00	4 65
64 "	5 "	44	2 "	325 00	12 00	5 00
66 "	5 "	48	2 "	360 00	15 00	5 35
68 "	5 "	48	2 "	400 00	18 00	5 75
70 "	4 "	52	2 "	450 00	21 00	6 15
72 "	4 "	52	2 "	500 00	24 00	6 55

Ten extra sets of Points given with each Saw, whether new or altered from a solid tooth.

Above list gives number of teeth allowed in No. 3 Saw, especially adapted for hard wood.

OREGON TOOTH No. 1.

Adapted principally for use on the Pacific Coast.



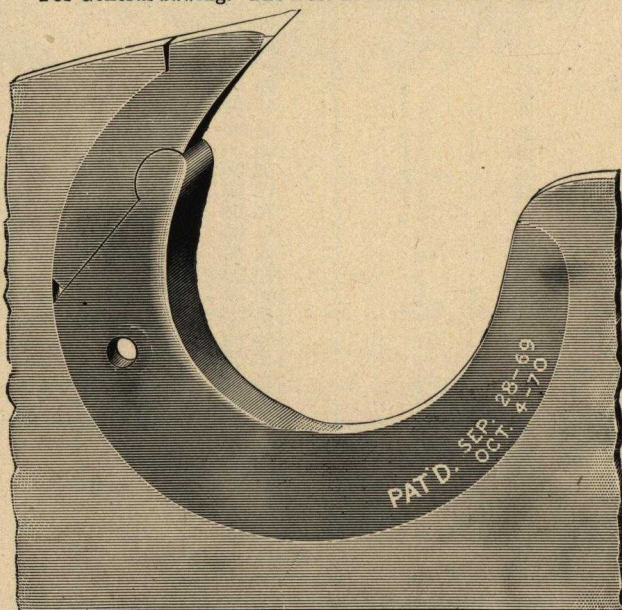
The above Cut shows the Full Size of Tooth.

The following list gives the number of teeth allowed in the No. 1 Chisel Point Saw:

Size.....20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72 inches.
 No. Teeth....10, 10, 12, 12, 14, 14, 16, 18, 20, 20, 22, 24, 24, 26, 28, 30, 30, 32, 32, 34, 34, 36, 36, 40, 40, 44, 44.

OREGON TOOTH No. 2.

For General Sawing. The Best Tooth in Frozen Timber.



The above Cut shows the Full Size of Tooth.

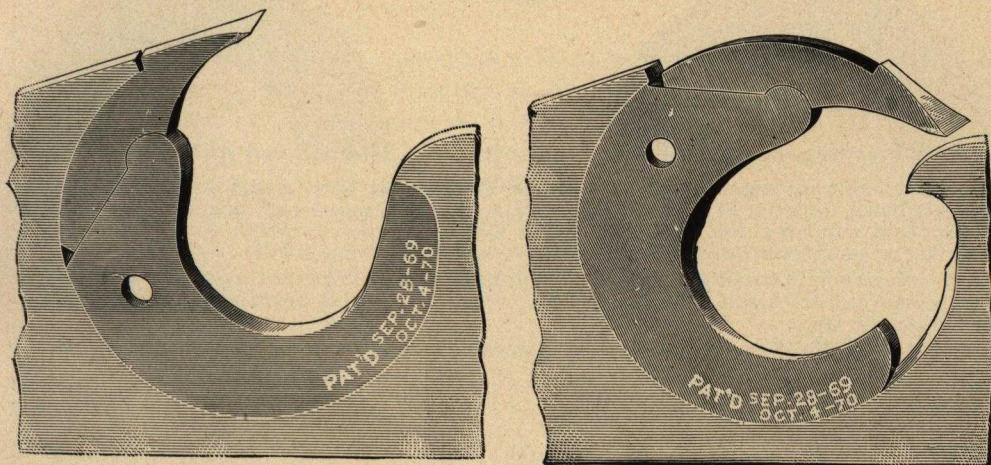
The following list gives the number of teeth allowed in the No. 2 Chisel Point Saw:

Size.....20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72 inches.
 No. Teeth....12, 12, 14, 14, 16, 16, 18, 20, 22, 22, 24, 26, 26, 28, 30, 32, 34, 36, 36, 38, 38, 40, 40, 44, 44, 48, 48.

Ten sets of extra Points given with each saw, whether new or altered from a solid tooth.

For price, see page 381

CHISEL TOOTH No. 4.
IMPROVED.



THE BEST TOOTH FOR EDGERS AND BOLTER SAWS.

The following list gives the number of teeth allowed in the No. 4 Saw:

Sizes,	18,	20,	22,	24,	26,	28,	30,	32,	34,	36,	38,	40,	42 inches.
No. Teeth,	16,	18,	20,	22,	22,	24,	24,	26,	26,	28,	28,	30,	32

For prices, see page 381

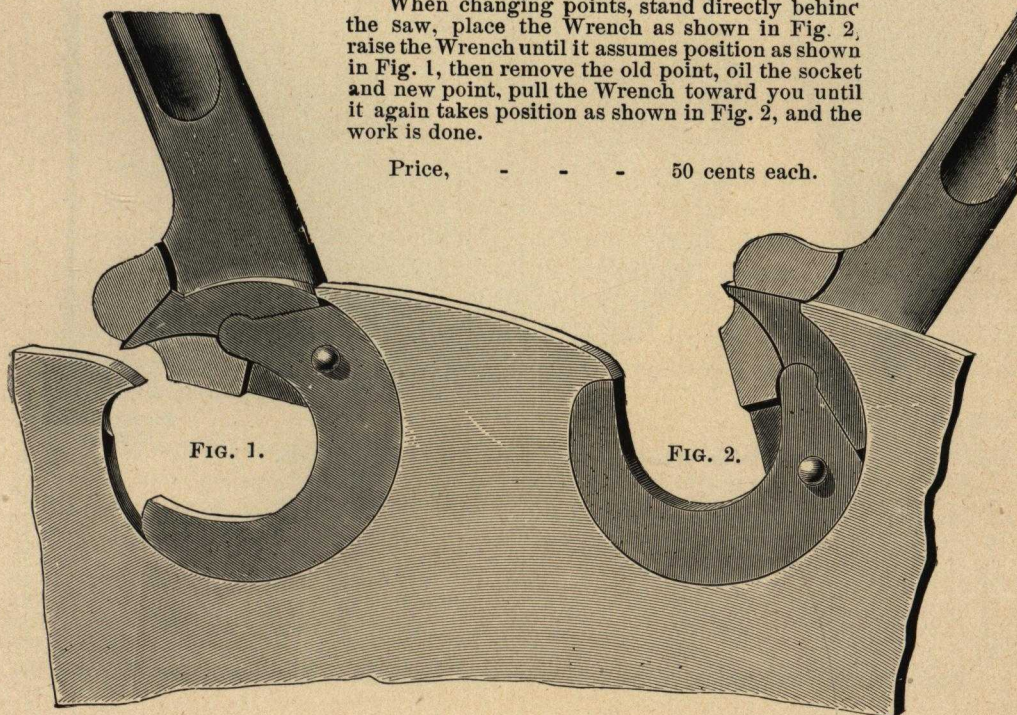
IMPROVED CHISEL POINT WRENCH.

A recent valuable improvement is in the style and shape of our Wrench for taking on old or worn teeth and putting new ones in.

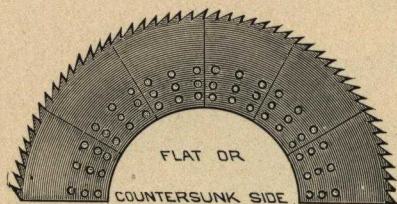
The use of this Wrench does away entirely with all difficulty, and greatly facilitates the work of changing the teeth, as the peculiar shape and position of the "BOSS" on Wrench prevents teeth from riding, carries them firmly and securely to their places.

When changing points, stand directly behind the saw, place the Wrench as shown in Fig. 2, raise the Wrench until it assumes position as shown in Fig. 1, then remove the old point, oil the socket and new point, pull the Wrench toward you until it again takes position as shown in Fig. 2, and the work is done.

Price, - - - 50 cents each.



Left-hand. **VENEERING SAWS IN SEGMENTS.** Right-hand.



When ordering segments, give gauge or thickness at butt, gauge or thickness at edge, depth of bevel, diameter of saw that segments are to form, number of segments in saw, depth of segments, number of teeth in each segment, sample of screw by which to drill and countersunk flat or countersunk side, and direction in which teeth run (see cut).

In ordering for a flange that has been drilled, send a sheet iron or tin templet or a correct tracing, showing holes and other particulars; or one of the old segments, giving the depth they originally were.

12 inches deep.	No. 5 gauge,	per foot in diameter of Saw,		\$17.00
12 "	" 6 "	" "	" "	16.25
12 "	" 7 "	" "	" "	15.50
12 "	" 8 "	" "	" "	14.50
12 "	" 9 "	" "	" "	14.00
12 "	" 10 "	" "	" "	13.50

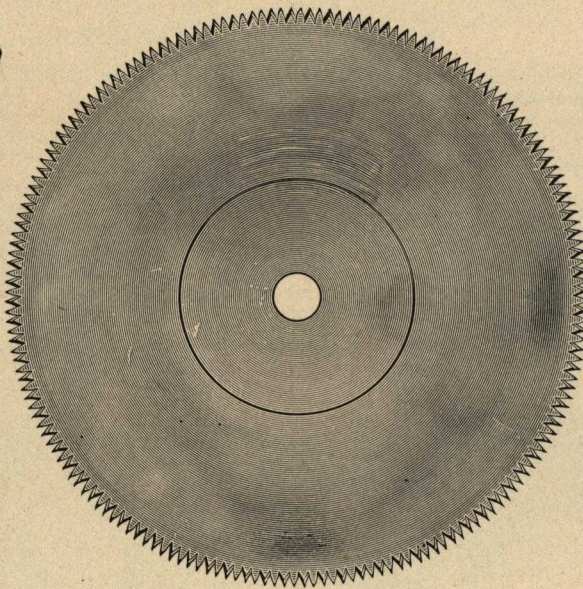
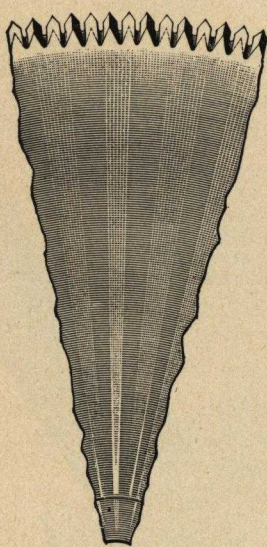
Add 5 per cent. for each additional inch in depth.

Deduct 5 per cent. for each inch under 12 inches in depth.

CIRCULAR MITRE SAWS.

These saws are ground to run without set; especially adapted for smooth cutting, such as Cabinet and Cigar-box work.

When ordering, give size of center hole, also diameter of collars on mandrel.



Showing shape and filing of teeth.

Size.
6 inches.
7 "
8 "
9 "
11 "
12 "
14 "
16 "
18 "

Gauge at hole.
19
19
19
18
17
17
17
16
16

Gauge at teeth.
16
16
16
15
14
14
14
13
13

Showing method of grinding.

Price each
\$3.50
3.75
4.00
4.75
5.25
5.75
6.75
7.50
8.25

Extra gauges heavy and bevelling will be charged for same as our regular Circular Saw list.

THE MOTION OF THE SAW.

This is one of the most essential things to be observed, and no one can give this too much attention. If the speed of the saw is too high, it cannot do good work, besides rendering it liable to many accidents. It generates heat in the saw, makes it touchy and limber, and it will only run and do good work on light feed, and while the teeth are in the best of order, and have a keen, sharp, cutting corner; as soon as this is gone, the saw will run or dodge whenever it comes in contact with the least obstacle. And again: Too low a speed has its objections, but it is not attended with such ruinous effects upon the saw. These difficulties can be remedied to a limited extent by the hammering of the saw, but cannot be entirely overcome.

TABLE OF SPEED FOR CIRCULAR SAWS.

Size of Saw, Inches.	Revolutions per Min.	Size of Saw, Inches.	Revolutions per Min.
8.....	4,500	42.....	.870
10.....	3,600	44.....	.840
12.....	3,000	46.....	.800
14.....	2,585	48.....	.750
16.....	2,222	50.....	.725
18.....	2,000	52.....	.700
20.....	1,800	54.....	.675
22.....	1,636	56.....	.650
24.....	1,500	58.....	.625
26.....	1,384	60.....	.600
28.....	1,285	62.....	.575
30.....	1,200	64.....	.550
32.....	1,125	66.....	.545
34.....	1,058	68.....	.529
36.....	1,000	70.....	.514
38.....	950	72.....	.500
40.....	900		

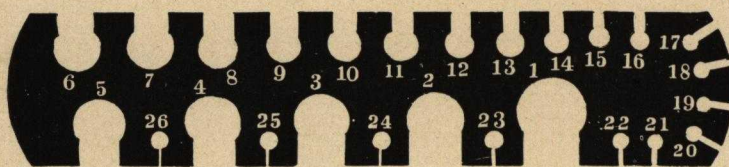
This table is as near right as can be arrived at from our own experience, and from the best sawyers and millwrights, when the mill and gear are firm and in good order. A mill that is old and rickety, and trembles so as to jar and cause the saw to vibrate, should have the speed lessened accordingly. The belts should be neatly laced and kept straight, especially the one that runs over the pulley on the mandrel, carefully avoiding everything that will cause the saw to vibrate. Also look well to the carriage; see that the track is straight, solid, level and true. Any saw after being in use for a long time will grow limber, and should be re-hammered and stiffened; after which—if properly done—it will be as good as new.

By carefully observing these rules respecting the care and attention due a circular saw, there will be labor and money saved. A circular saw is not unlike any other tool which has a great amount of work to do, it has its peculiarities, and needs to be kept in good order to do good work.

ORDERING CIRCULAR SAWS.

When ordering large Circular Saws, the following directions should be given:

Diameter of saw in inches; thickness or gauge of saw at rim; thickness or gauge of saw at centre; right or left-hand saw, when standing with saw cutting towards you; number of teeth in saw, or the space from point to point; size of mandrel hole; size of pin holes; distance from centre to centre of pin holes; greatest feed at each revolution of saw, in inches; kind of lumber to be sawed; number of revolutions of saw per minute. When ordering small saws, say whether for rip or cross-cut sawing. When ordering large saws, say whether you swage or spring-set the teeth.



ORDER BY THIS GAUGE.

Gauge No.	4	.....	is.....	$\frac{1}{4}$ inch	scant.
"	5	.....	is.....	7-32	"
"	6	.....	is.....	3-16	" full.
"	7	.....	is.....	3-16	" scant.
"	8	.....	is.....	5-32	"
"	9	.....	is.....	5-32	" scant.
"	10	.....	is.....	$\frac{1}{8}$	" full.
"	11	.....	is.....	$\frac{1}{8}$	" scant.
"	12	.....	is.....	3-32	" full.
"	16	.....	is.....	1-16	" full.

TERMS OF WARRANTY.

Each saw is warranted free from flaws and seams, and practically true. If found defective in either of these particulars, it may be returned at shipper's expense; and if, on examination by us, we are satisfied the saw is at fault, a new one will be given in exchange, or the saw will be re-hammered or made good.

The practice of using a cold chisel for retoothing a Saw, is almost certain to crack the plate, and corners filed square in the gullet of the tooth will frequently produce the same result, particularly in frosty weather.

Our warranty does not cover saws breaking from either of the above causes.

Any alteration in the holes of Circular Saws by filing, reaming, or otherwise, will generally spring the saw. When such alteration is made, the saw will not be subject to the above warranty.

RATES FOR REPAIRING CIRCULAR SAWS.

INCH.	Hammering.	Gumming and Hammering.	Cutting down, Re-tothing and Hammering.	First Gauge, Grinding.	Grinding each additional gauge afert the first.	Setting and Sharpening.
4	\$ 20	\$ 40	\$ 50	\$ 35	\$ 18	\$ 35
6	30	50	60	40	21	45
8	40	65	75	50	25	55
10	50	80	85	60	35	65
12	60	90	1 00	70	45	75
14	70	1 00	1 25	90	60	85
16	80	1 20	1 45	1 10	70	95
18	95	1 40	1 70	1 30	80	1 05
20	1 10	1 65	1 95	1 45	90	1 15
22	1 25	1 90	2 15	1 65	1 00	1 30
24	1 40	2 15	2 35	1 80	1 12	1 45
26	1 60	2 40	2 70	2 00	1 25	1 60
28	1 80	2 70	3 05	2 25	1 35	1 75
30	2 00	3 00	3 45	2 55	1 45	1 95
32	2 20	3 30	4 00	2 80	1 55	2 05
34	2 45	3 70	4 60	3 10	1 70	2 35
36	2 75	4 10	5 10	3 35	1 85	2 55
38	3 30	5 00	6 40	3 65	2 00	2 75
40	3 80	6 00	7 75	3 80	2 20	2 95
42	4 40	7 00	9 00	4 00	2 40	3 15
44	5 00	7 85	9 80	4 30	2 70	3 35
46	5 50	8 50	10 60	4 70	3 00	3 60
48	6 00	9 00	11 25	5 10	3 35	3 80
50	6 50	9 75	12 20	5 50	3 60	4 10
52	7 10	10 70	13 35	6 00	4 00	4 40
54	7 60	11 75	14 70	6 75	4 30	4 70
56	8 20	12 95	16 20	7 40	4 60	5 00
58	9 00	13 95	17 40	8 05	4 85	5 30
60	9 80	14 95	18 50	8 90	5 25	5 60
62	10 60	16 00	20 00	9 70	5 65	6 00
64	11 50	17 10	21 30	10 50	6 05	6 30
66	12 30	18 20	22 60	11 35	6 45	6 60
68	13 10	19 70	24 00	12 10	7 00	6 90
70	14 00	21 25	25 50	12 95	7 55	7 20
72	15 00	23 50	28 00	13 75	8 10	7 50

When the saw is ground, add to price of grinding the price of hammering as in the first column; when ground and gummed, add to price of grinding the price of gumming and hammering, as in second column.

MILL SAWS..... { Gumming and Hammering..... \$ 1 00 each.
Hammering..... 75 "
Setting and Sharpening..... 1 00 "

MULAY SAWS..... { Gumming and Hammering..... \$ 1 25 each.
Hammering..... 1 00 "
Setting and Sharpening..... 1 00 "

CROSS CUT SAWS..... { Gumming and Hammering..... 15 cents per foot.
Hammering..... 10 "
Setting and Sharpening..... 10 " "

N. B.— Breakage in repairing at the owner's risk.

FELLOE WEB SAWS.

10 inch	18 Gauge	\$ 1 60	per doz.	3-16 to $\frac{1}{2}$ inch wide.
12 "	18 "	1 85	"	$\frac{1}{2}$ to $\frac{1}{2}$ "
14 "	17 "	2 10	"	$\frac{1}{2}$ to $\frac{1}{2}$ "
16 "	17 "	2 35	"	$\frac{1}{2}$ to $\frac{1}{2}$ "
18 "	17 "	2 70	"	$\frac{1}{2}$ to $\frac{1}{2}$ "
20 "	17 "	3 00	"	$\frac{1}{2}$ to $\frac{1}{2}$ "
22 "	17 "	3 30	"	$\frac{1}{2}$ to $\frac{1}{2}$ "
24 "	17 "	3 65	"	$\frac{1}{2}$ to $\frac{1}{2}$ "
26 "	17 "	4 00	"	$\frac{1}{2}$ to $\frac{1}{2}$ "

Five per cent. extra for each additional gauge to 14 gauge; above 14 gauge, special prices. Extra widths, 10 per cent. for every additional $\frac{1}{2}$ inch wide.

N. B.—All Web Saws $\frac{1}{2}$ inch and narrower, will be made with wide ends, in order to give strength at the hole. Price, 25 per cent. advance.

TURNING WEB SAWS.

10 inch	22 Gauge	\$ 1 35	per doz.	3-16 to $\frac{1}{2}$ inch wide.
12 "	21 "	1 45	"	3-16 to 5-16 "
14 "	21 "	1 60	"	3 16 to 5-16 "
16 "	20 "	1 80	"	$\frac{1}{2}$ to $\frac{1}{2}$ "
18 "	20 "	2 00	"	$\frac{1}{2}$ to $\frac{1}{2}$ "
20 "	20 "	2 25	"	$\frac{1}{2}$ to $\frac{1}{2}$ "
22 "	20 "	2 50	"	$\frac{1}{2}$ to $\frac{1}{2}$ "
24 "	19 "	2 80	"	$\frac{1}{2}$ to $\frac{1}{2}$ "
26 "	19 "	3 10	"	$\frac{1}{2}$ to $\frac{1}{2}$ "

When two gauges heavier than above list, Felloe Web prices will be charged: extra widths, 10 per cent. extra for each additional $\frac{1}{2}$ inch wide.

**EUREKA SCROLL SAWS, BEVELED BACKS, SET AND FILED.
17 GAUGE AND THINNER.**

Length, inches.	8	10	12	14	16	18	20
Price, per doz.	\$ 1 44	1 80	2 16	2 62	2 83	3 24	3 60

Scroll Saw Blades, wider than $\frac{1}{2}$ in., $\frac{1}{2}$ cent per inch extra.

In ordering Saws, be sure to state whose make Machine the Blades are to be used on, and give length gauge and number of teeth.

SCROLL SAWS for FAY'S PATENT MACHINE.

8 inch	per doz.	\$ 2 50	14 inch	per doz.	\$ 4 00
9 "	"	2 75	16 "	"	4 50
10 "	"	3 00	18 "	"	5 00
11 "	"	3 25	20 "	"	5 50
12 "	"	3 50	22 "	"	6 00
13 "	"	3 75	24 "	"	6 50

Over $\frac{1}{2}$ inch wide, extra price.

We make the above Webs from 13 to 16 gauge in thickness,

SCROLL SAWS for BEACH'S MACHINE.

LIST No. 1.		LIST No. 2.	
WIDTH.	LENGTH.	WIDTH.	LENGTH.
3-16.....	14 inch, each \$ 16	3-16.....	14 inch, each \$ 18
1-4.....	16 " 20	1-4.....	16 " 22
3-8.....	16 " 22	3-8.....	16 " 24
1-2.....	18 " 24	1-2.....	18 " 26

Each of the above are ground backs, set, filed and fitted to your machine ready for use.

Each of the above are patent ground, beveled from the teeth to the back edge, and require little or no set, filed and fitted to your machine, ready for use.

Other sizes will be furnished upon application. In ordering, state whether from List No. 1, or from List No. 2.

**REDUCED PRICE LIST OF PATENT TEMPERED
SPECIAL STEEL BAND SAWS FOR MILLS.**

JOINED, POLISHED; SET AND FILED.

3	3½	4	4½	5	5½ in.
\$0.80	1.00	1.20	1.35	1.50	1.65 per ft.
6	7	8	9	10 in.	
\$1.80	2.15	2.50	3.00	3.50 per foot.	

NOT JOINED; SET OR FILED.

½	¾	1	1¼	1½	1¾ in.
\$0.07	0.07	0.07	0.09	0.10	0.12 per ft.
¾	1	1¼	1½	1¾	1¾ in.
\$0.14	0.16	0.18	0.20	0.23	0.26 per ft.
1½	1¾	2	2¼	2½	2¾ in.
\$0.28	0.34	0.40	0.48	0.50	0.55 per ft.

Setting and Filing 3 cents per foot extra. Brazing to 1 inch, 30 cents each extra.

Brazing over 1 to 1¾ inches, inclusive, 50 cents each extra; from 2 to 2¾ inches, inclusive, 80 cents each extra.

VALUE OF BLADES.

That a good blade is cheap at any price, and an inferior one is dear, are propositions which no one with experience will dispute. To this we may add that a good blade operated on a properly constructed machine, has a capacity for wear, and will do more work, than the "same value" represented in a circular saw. The purchaser cannot, from the appearance of a Band Saw Blade, tell much of its quality or temper, nor can he do so by experiment, without injuring the blade; and he must therefore depend mainly upon the good faith, reputation and experience of those from whom he purchases.

In order to have good work done, it is absolutely necessary that the saw should be kept perfectly true in every respect.

To keep saws true, the points of the teeth, just before filing, should be jointed with a stone or emery brick.

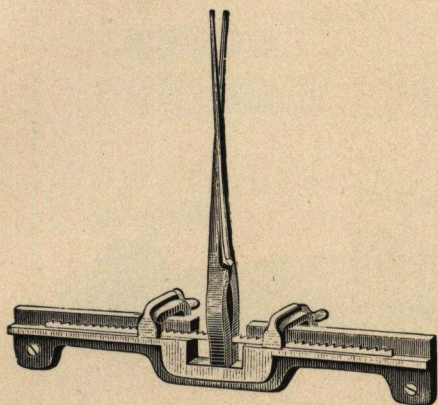
Then comes setting; this should be produced by blows, and not by bending. Setting by a blow, with the proper kind of a machine, is done very quickly, and the teeth are set perfectly uniform.

Then, after setting, if the saw is touched up with a file, it will be in good order.

Now as to the use. Do not attempt to use a saw when it is dull. Do not attempt to cut a small circle with a wide blade. Keep your saw sharp, with a good set in it, and you will get good wear out of it.



WELDING APPARATUS.



DIRECTIONS FOR BRAZING BAND SAW BLADES.

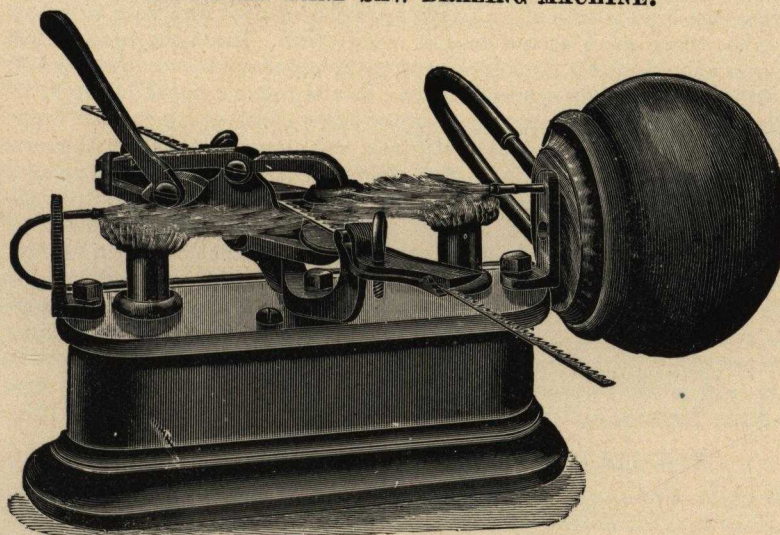
First. Wash the hands well with grease or even sweat. 2d. File the two ends of blade to a bevel, so that the two thicknesses together will not be thicker than the rest of the blade. Don't file exactly to a feather edge, but file a slight shoulder for the ends to rest under. 3d. Adjust ends in vise, so that the teeth will match; also, see that the back is parallel with the vise, and that the ends are so that the tongs will hold them over depression in the vise. 4th. Place a small piece of silver solder, washed with muriatic acid, between the ends of the saw, and also wash the ends of the saw with muriatic acid. The silver solder must be thin as paper, and must just cover the beveled parts. 5th. Heat your welding tongs to a red heat, and let one end rest on the depression of the vise, and squeeze the ends until the silver is well melted, and let the blade cool gradually. File the joint very smoothly, but don't hammer or twist the blade too much.

Price, including Silver Solder for 20 welds.....\$5 00

SILVER SOLDER.

Extra fine quality, for soldering Band Saws, per ounce.....\$2.00

IMPROVED BAND SAW BRAZING MACHINE.



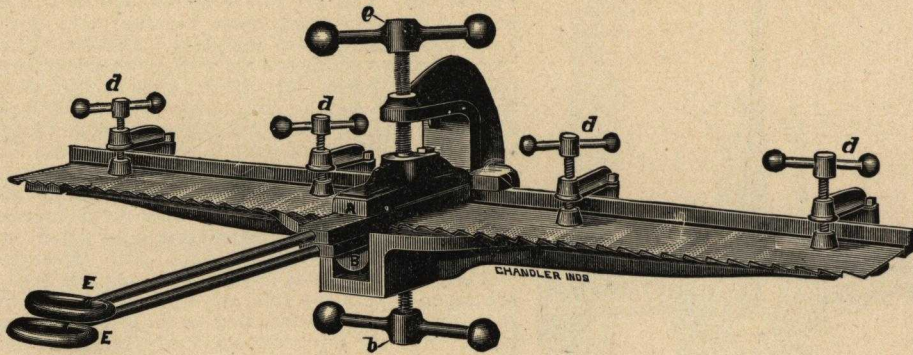
This represents our new and improved Band Saw Brazing Machine, which has been designed for rapid brazing of band saws up to 1½ inches in width. This machine does away with the tongs and the frequent kinks put into the saws by them; the burning of saws from over heating; the poor brazes from underheating; the curved backs from slipping of clamps.

DIRECTIONS:—File the laps; place in the clamps back to the straight edge; close the clamps by the thumb-screws; place the solder in the lap, using plenty of acid; light the lamps, fill the rubber globe by blowing in the mouth-piece (twice blowing will be sufficient for small saws). Watch till the solder flows, then press down on the lever when the clamps will seize the saw firmly and give the saw the required temper without any danger of checking or being too hard. Smooth the laps with a fine file. Any man can make a better lap joint after three trials than expert with tongs. Use kerosene oil and raise the wicks to get a good flame.

Price.....\$10 00

BRAZING TOOLS, FOR BRAZING BAND SAWS FOR LOG MILLS.

WILL BRAZE BLADES UP TO 12 INCHES WIDE.

**Directions for Brazing.**

Before commencing the operation of brazing, lay that portion of the saw to be brazed on the table between the clamps, noting that the clamp screw *e* is midway between back and front of saw. To insure uniform pressure its entire width, the table is adjusted to any width saw by means of the four steel keys which are placed in the parallel slots cut in the face of the table, at equal distances from back rib, and which form a true bearing for the back of saw. In preparing the braze, the upper clamp *A* can be swung to the left, parallel with saw, thus making that portion of the blade more accessible and readily seen. Place the brazing irons *EE* in position, one over and one under the saw; adjust the lower clamp by use of screw *b*, so that the brazing iron will bear uniformly against the saw; then adjust the upper clamp so that in the operation of brazing, one or two turns of the upper screw *e* will clamp the saw firmly. Bevel the ends of saw on opposite side to a width of $\frac{3}{4}$ inch, and clean the surface with muriatic acid; clean a strip of silver solder $\frac{3}{4}$ inch wide with the acid, lay the saw upon the brazing table with the bevel ends lapped $\frac{3}{4}$ inch, and place the clean strip of silver solder between the beveled ends. Tighten the clamps *dddd* to hold the saw uniformly in position, with the back parallel with the back rib of the table. The brazing irons *EE* are to be heated to a cherry red in a moderate clear fire on the forge. Charcoal is the best fuel. If coal containing sulphur is used, the sulphur should first be burned off before putting the irons on the fire; the irons being at a uniform cherry red heat, place one under, between the saw and lower clamp, and the other one between the saw and upper clamp; then tighten the upper clamp by turning screw *e*, and leave the saw in this position until cold. The brazing irons *EE* should be kept of even thickness by filing, repeated heating being liable to scale them unevenly. Price, \$25 00.

MURIATE OF ZINC, FOR SOLDERING OR BRAZING.

Feed Muriatic Acid all the small pieces of zinc that it will eat; dilute with an equal amount of rain or distilled water (condensed steam water) and it is ready for use.

TO MAKE BORAX WATER FOR SOLDERING OR BRAZING.

Burn a sufficient quantity of borax on a hot shovel or piece of sheet iron, or in an iron dish; then pulverize and boil in rain or condensed water to the consistency of cream.

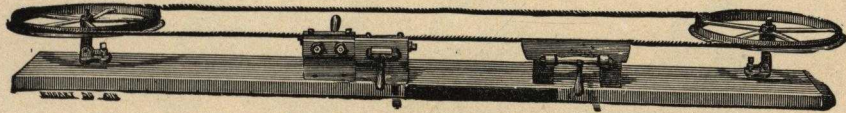
RUBBER BANDS.

For Band Saw Wheels, per pound..... \$1 25

CEMENT.

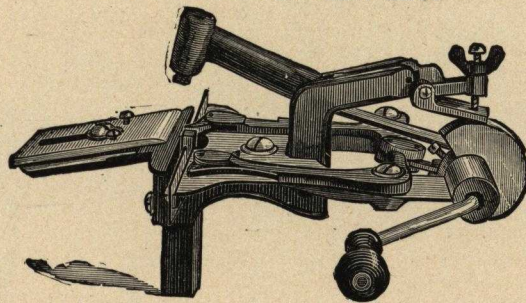
For Cementing Rubber Bands on the wheels, per can of one pint..... 60

BAND SAW FILING AND SETTING APPARATUS.



Price, Complete.....	\$30 00
Filing Vise and Wheels.....	18 00
Setting Vise only.....	12 00
Filing Vise only.....	9 00

AUTOMATIC BAND SAW SET.

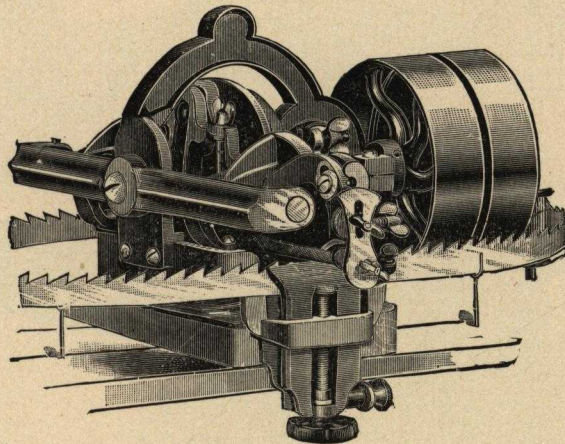


This is one of the most practical and complete tools for the purpose ever invented; with it a boy can set perfectly a saw in about five minutes, and will set all sizes from $\frac{1}{8}$ to 2 inches in width and any size teeth.

Full instructions and directions are enclosed with each machine.

Price, Complete.....\$10 00

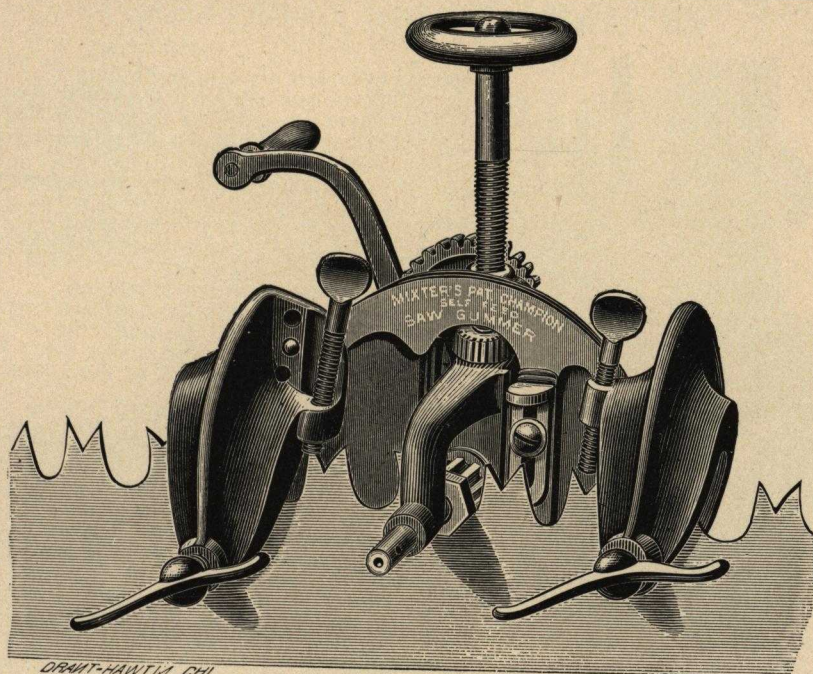
THE AMBLER PERFECT FILING MACHINE FOR BAND SAWS.



WHAT IT WILL DO.

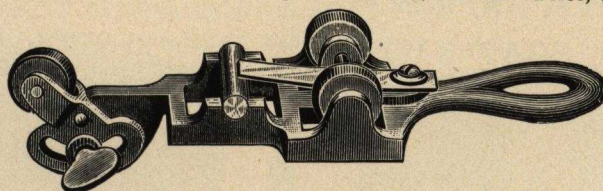
It will file your saws without your attention.
 It will save you 50 per cent in the cost of files.
 It will file saws sharper than by hand.
 It will encourage your men to keep them sharp.
 It will thus save your saws from breakage.
 It will pay for itself in a few months.
 These things appeal strongly to the good sense of every business man, for they show a better margin than can be made on investments in lumber or stock.

Price\$35 00



MIXTER'S CELEBRATED CHAMPION GUMMER.

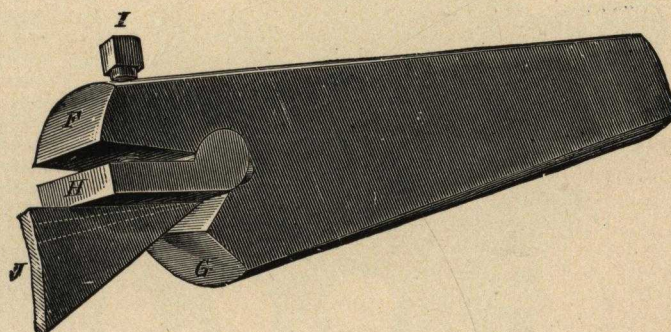
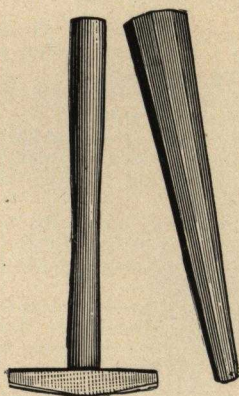
The above engraving represents the Patent Improved Champion Gummer in position to gum Mill Saws or cross-cut Saws. It can be quickly adjusted to any angle or line from horizontal to perpendicular. A ratchet wheel and pawl is attached to the cutter shaft to prevent the breaking of cutters by revolving backwards. It is the most perfect Gummer made. Price, \$30.00.



IMPROVED CUTTER GRINDER.

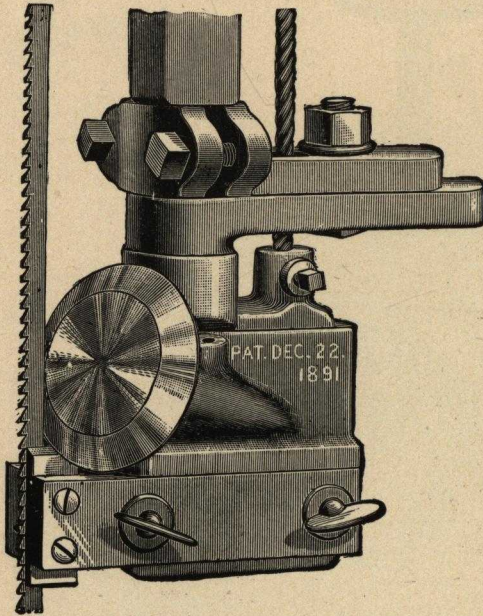
Grinds the Cutters perfectly round. Price, - \$1.00.

EMERSON'S ADJUSTABLE JAW SWAGE.



Price, - PATENTED SEPTEMBER 16, 1873. - \$4 00

Steel Swages, five and eight corners, with Hammer, each, - - - \$8 00

THE PRYIBIL NON-FRICTION BAND-SAW GUIDE.**ADVANTAGES.**

Fits any machine and any saw.
 Does not crystallize the saw or heat it.
 Does not groove or wear out of shape.
 Does not waste its oil or require frequent lubrication.
 Does not require wrenches or screw-driver to adjust it to different saws.
 Is adjustable in all directions.
 Has wide side-guides to keep the saw from twisting and running.
 Prevents saws from breaking.
 With this guide the saw bears against the beveled edge of an anti-friction roller of hardened steel. This roller has a long, inclined bearing, closed at the bottom to prevent the escape of oil.

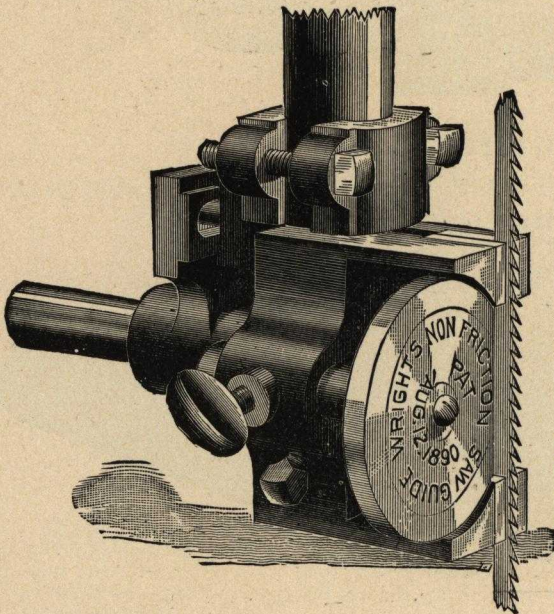
The side guides are of hardened steel, wide and long, to insure durability and to give a good bearing on the saw to prevent twisting and "running."

The roller can be set forward or back to accommodate the position of the saw on the wheel, and the side-guides can be independently set to cover the saw close up to the teeth. The wider their bearing, the less the friction and the less the saw will "run."

The side guides can be accurately set to different thicknesses of saws and they can be angled to compensate for any wear that may occur at their front edges.

The entire guide can be attached to any machine in a few minutes, without the aid of any tools except a monkey-wrench. When once in position it can be quickly adjusted to any width or thickness of saw without the aid of wrenches or screw-drivers.

- | | |
|--|--------------|
| No. 1. For Saws up to 1 inch wide..... | \$10 00 net. |
| No. 2. For Saws up to 2 inches wide..... | \$15 00 net. |

WRIGHT'S NON-FRICTION BAND-SAW GUIDE.

Where the back of saws run against stationary guide plates, much heat is generated by the friction, causing saws to expand and crystallize at the back. This beyond doubt is the great cause of saws checking and breaking. If oil is used to overcome the difficulty it soon destroys the rubber on the large wheels.

A FEW REASONS WHY THESE GUIDES ARE SUPERIOR TO OTHERS.

Because—We avoid friction, avoid using oil, at the same time having a good firm support for the saw.

Because—It is instantly adjusted to any width or thickness of saws.

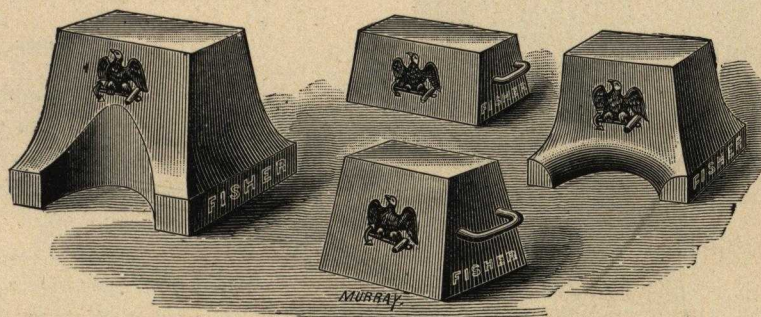
Because—We have narrow side guides above and below the back-bearing which are spread apart, preventing the side of the saw from heating.

Because—The wearing parts are so constructed, should they become broken or lost, they can be replaced at a mere trifle.

Because—They can be readily attached without injury to the machine; and if not found just as represented, may be returned.

Price of Small Guide, taking saw from one inch in width to one-sixteenth.....\$10 00 net.
 Price of larger sizes will be given on application, depending upon width of saws used, and difficulty of applying to machine.

SAW ANVILS, HAMMERS and STRAIGHT EDGES for HAMMERING SAWS.
EAGLE SAW ANVILS.



Body made of gun metal. CRYSTALIZED IRON, which neither settles nor breaks. Face is of BEST TOOL CAST STEEL and warranted never to come off. The face is planed to a perfectly true surface, and always remains so, and is made so hard that no hammer can make an impression on it. For large Circular Saws we advise using heavy Anvil, as there is less rebound to the hammer, making the blow more effective.

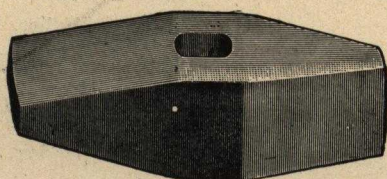
We have them of following dimensions and weights:

Nos.	Size of Face.	Height of Anvil.	Weight.	Price.
1	10 inches long, 6 inches wide.	5 inches.	85 lbs.	\$ 10 50
2	9 " " 4½ "	8 "	100 "	12 50
3	10 " " 6 "	8 "	150 "	18 00
4	9 " " 6 "	10 "	200 "	25 00
5	11 " " 6 "	12 "	250 "	32 00

Nos. 1 and 2 have handles on the end.

SAW HAMMERS.

Forged Solid English Steel with handles, Weights 3 to 8 lbs.



CROSS PENE.

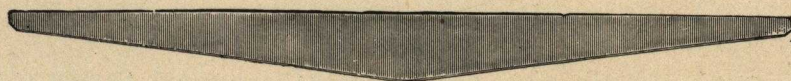


ROUND FACE.

Prices,..... 5 lb. Hammer, \$3 50; 6 lb., 4 00; 7 lb., 4 50; 8 lb., 5 00

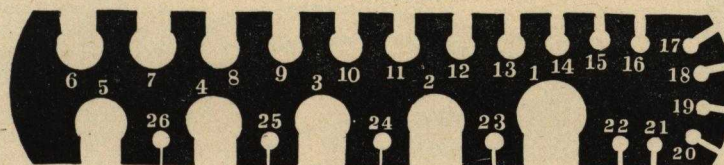
STRAIGHT EDGES.

Lengths, 1 to 4 feet.

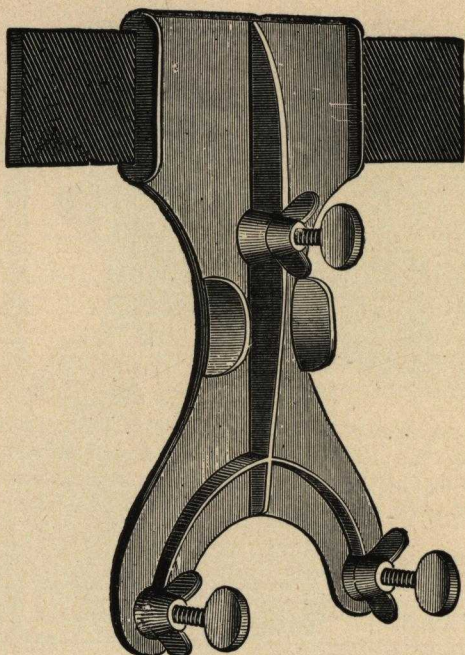


Prices,..... 1 ft. long, \$ 1 00; 1½ ft., 1 50; 2 ft., 2 00; 2½ ft., 2 50
3 ft., 3 00; 3½ ft., 3 50; 4 ft., 4 00

SAW GAUGES.



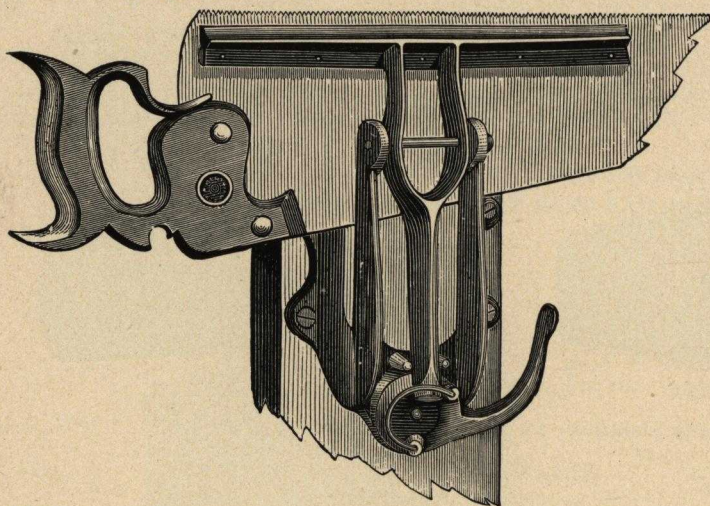
Price,..... each \$ 1 50

**MIXTER'S SIDE FILE,****or Saw Tooth Jointer.**

The Side File is used for the purpose of regulating Saw teeth after they have been set. It is impossible to set or upset a saw so that some of the teeth will not extend or be bent over a little more than others, and thus make rough lumber. By the use of this instrument all the teeth are made even, and a saw thus regulated will run twice as long without sharpening and do much better work. In short, it is indispensable in fitting up a saw for sawing smooth lumber.

PRICE.

No. 1.....	\$1 50
No. 2.....	1 75

**WENTWORTH'S
PATENT SAW VISE.****No. 1.**

It has a Flexible Rubber Cushion, or Muffler, between the Jaws, which prevents any vibration and renders saw-filing noiseless.

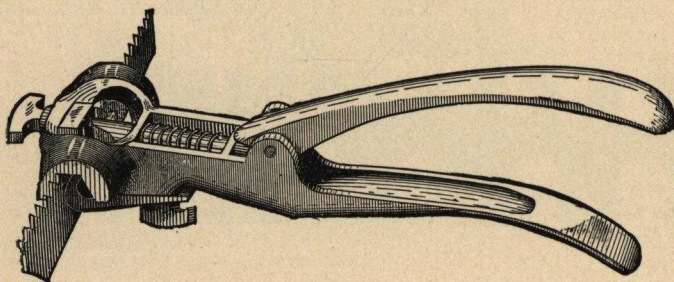
Price, No. 1, per doz...\$15 00

Price, No. 2, not illustrated,
same as No. 1, only larger
and stronger, has jaws 12
inches long.....\$21 00

MORRILL'S PERFECT SAW SET.

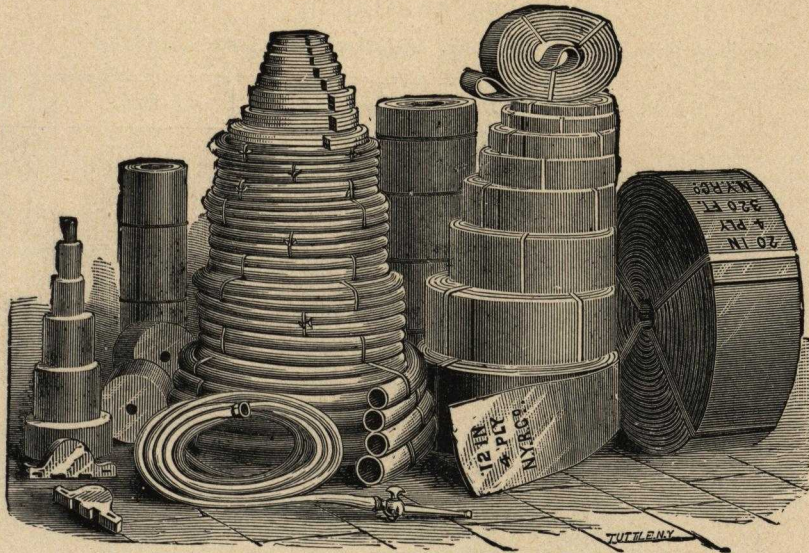
For Setting any kind of Saw Perfectly, Hand, Band, Scroll, Circular or Mill.

(PATENT ALLOWED AUGUST, 1879.)



No. 1, For Band Saws, from 22 to 16 G.....	\$1 25
No. 1, For Hand Saws, from 32 to 16 G.....	\$1 25
No. 3, For Single Tooth Cross Cut and Small Circular Saws, 20 to 14 G.....	\$2 00
No. 4, For Champion M Tooth Cross Cut, 22 to 14 G....	\$2 00
No. 5, For Board and Timber Saws and all kinds of Re-Saws, from 6 to 14 G.....	\$3 50

BELTING, HOSE AND PACKING.



OAK TANNED LEATHER BELTING.

WIDTH. INCHES.	PRICE. PER FT.	WIDTH. INCHES.	PRICE. PER FT.	WIDTH. INCHES.	PRICE. PER FT.	WIDTH. INCHES.	PRICE. PER FT.
1	\$.10	4½	\$.56	13	\$1.68	24	\$3.54
1½	.13	5	.63	14	1.82	26	3.92
1¾	.17	5½	.70	15	1.98	28	4.30
1¾	.20	6	.76	16	2.14	30	4.64
2	.23	6½	.83	17	2.31	32	5.00
2½	.26	7	.90	18	2.49	34	5.35
2½	.30	8	1.02	19	2.66	36	5.70
2¾	.33	9	1.15	20	2.84	40	6.40
3	.36	10	1.29	21	3.02	44	7.10
3½	.43	11	1.42	22	3.20	48	7.80
4	.50	12	1.55	23	3.37		

Double Belts twice the price of single.

SCHULTZ'S PATENT FULLED LEATHER BELTING.

This Belting is made of leather tanned on the surface only, (the interior which is the fibre and strength of the hide) is not tanned, but rawhide fulled and softened. It works equally well for the largest driving belt, or for the fastest running machinery and smallest pulleys. For the convenience of our customers we give price of single, double and light double.

SINGLE			DOUBLE.				LIGHT DOUBLE.			
Inches wide.	Price per. ft.		Inches wide.	Price. per ft.		Inches wide.	Price per ft.		Inches wide.	Price per ft.
1	\$ 10		9	\$ 1 15		2	46		13	3 36
1½	13		10	1 29		2½	52		14	3 64
1¾	17		11	1 42		2¾	60		15	3 96
2	20		12	1 55		2¾	66		16	4 28
2	23		13	1 68		3	72		18	4 98
2½	26		14	1 82		3½	86		19	5 32
2½	30		15	1 98		4	1 00		20	5 68
2¾	33		16	2 14		4½	1 12		21	6 04
3	36		17	2 31		5	1 26		22	6 40
3½	43		18	2 49		5½	1 40		24	7 08
4	50		19	2 66		6	1 52		26	7 84
4½	56		20	2 84		7	1 80		28	8 60
5	63		21	3 02		8	2 04		30	9 28
5½	70		22	3 20		9	2 30		36	11 40
6	76		23	3 37		10	2 58		40	12 80
7	90		24	3 54		11	2 84		44	14 20
8	1 02		26	3 92		12	3 10		48	15 60
									10	1 94
									12	2 33
									14	2 73
									15	2 97
									16	3 21
									17	3 47
									18	3 74
									19	3 99
									20	4 26
									21	4 53
									22	4 80
									24	5 31
									26	5 88
									28	6 45
									30	6 96
									32	7 50
									34	8 03
									36	8 55

RUBBER BELTING.

Made up with Best Cotton Duck. A full roll contains about 300 feet.

WIDTHS.	2-PLY.	3-PLY.	4-PLY.	5-PLY.	6-PLY.
1 inch.	07				
1½ "	09				
1½ "	11	15	19		
2 "	15	17	21		
2½ "	18	22	26		
3 "	22	26	31		
3½ "	26	30	37		
4 "	30	34	42		
4½ "	33	39	47		
5 "	36	43	52		
6 "	43	52	62		
7 "	51	60	73		
8 "	59	70	84	1 05	1 26
9 "	67	80	95	1 18	1 42
10 "	75	90	1 07	1 33	1 60
11 "	83	1 00	1 18	1 47	1 77
12 "	91	1 08	1 30	1 62	1 95
13 "	1 00	1 18	1 42	1 77	2 13
14 "	1 08	1 28	1 54	1 92	2 31
15 "	1 16	1 38	1 66	2 07	2 49
16 "	1 25	1 50	1 78	2 22	2 67
18 "	1 41	1 70	2 02	2 52	3 03
20 "	1 58	1 90	2 26	2 82	3 39
22 "	1 76	2 12	2 52	3 15	3 78
24 "	1 96	2 36	2 80	3 50	4 20
26 "	2 15	2 60	3 08	3 85	4 62
28 "	2 35	2 84	3 36	4 20	5 04
30 "	2 55	3 10	3 64	4 55	5 46
32 "	2 75	3 35	3 92	4 90	5 88
34 "	2 95	3 60	4 20	5 25	6 30
36 "	3 15	3 85	4 48	5 90	6 72

ENDLESS BELTS.

Made to order, for which three extra feet will be charged for the splice, and ten per cent. additional on the net price of the whole belt.

SOLID WOVE COTTON BELT.

DIRECTIONS FOR LACING COTTON BELTING.

With a tri-square, cut the ends of the belt perfectly true. Do not cut the fabric, but use a large awl in making the holes. There should be, in each end of the belt, two rows of holes, placed zig-zag. The edge of no hole should come nearer to the sides of the belt than three-quarters of an inch, and not nearer the end than seven-eighths of an inch. The second row should be at least one and three-quarters of an inch from the end. On the wide belts these distances should be a little greater. Begin to lace in the centre of the belt and take much care to keep the ends exactly in line, and to lace both sides with equal tightness.

The lacing should not be crossed on the side of the belt that runs next to the pulley. Some prefer lapping the end and sewing together with lace-leather.

The ordinary lacings are best for lacing the belt, as they run without noise.

Price List.

TWO-PLY

1 inch.....\$0.04 | 2 inch.....\$0.06 | 3 inch.....\$0.08 | 4 inch.....\$0.10 | 6 inch.....\$0.18
 1½ " 5 | 2½ " 7 | 3½ " 9 | 5 " 14

THREE-PLY.

1½ inch.....\$0.07 | 3½ inch.....\$0.15 | 6 inch.....\$0.24 | 10 inch.....\$0.40 | 18 inch.....\$0.86
 2 " 9 | 4 " 16 | 7 " 28 | 12 " 50 | 20 " 96
 2½ " 11 | 4½ " 18 | 8 " 32 | 14 " 62
 3 " 13 | 5 " 20 | 9 " 36 | 16 " 75

FOUR-PLY.

4 inch.....\$0.21 | 6 inch.....\$0.30 | 9 inch.....\$0.44 | 14 inch.....\$0.75 | 20 inch.....\$1.15
 4½ " 24 | 7 " 34 | 10 " 50 | 16 " 90 | 22 " 1.35
 5 " 26 | 8 " 38 | 12 " 60 | 18 " 1.00

ENDLESS SAND BELTS.

Price per pound..... \$1 60

SOLID ROUND BELTS.

Diam. $\frac{1}{8}$ inch per foot \$.05 | Diam. 3-16 inch per foot .. \$.07 | Diam. $\frac{1}{4}$ inch per foot . . \$.10

TWISTED ROUND BELTS.

Diam. $\frac{1}{4}$ inch per foot.... \$ 14	Diam. $\frac{1}{2}$ inch per foot \$ 30	Diam. $\frac{3}{4}$ inch per foot \$ 60
" 5-16 " " 18	" " " " 36	" 1 " " " 72
" $\frac{3}{8}$ " " " 22	" " " " 46	

LACE LEATHER.

In ordering Lace Leather in the side, state whether you want light, medium or heavy sides.

RAW HIDE SIDE LACE LEATHER.

Per square foot..... \$.30



RAW HIDE CUT LACING.

$\frac{1}{4}$ inch per 100 feet..... \$ 1 00	$\frac{1}{2}$ inch per 100 feet \$ 2 30
5-16 " " " 1 35	" " " " 2 90
$\frac{3}{8}$ " " " 1 65	" " " " 3 50

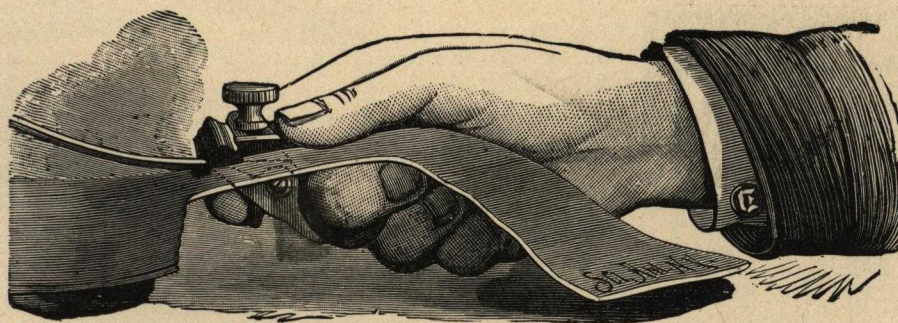
STEEL BELT COUPLINGS.

FOR ROUND AND TWIST BELTING



Price per Dozen.

Size.....	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{2}$	5-16	$\frac{3}{8}$	7-16	$\frac{1}{2}$	9-16	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$
Price	\$ 2 00	2 00	2 00	2 50	3 00	3 50	4 00	5 00	6 00	9 00	13 00	18 00	22 00



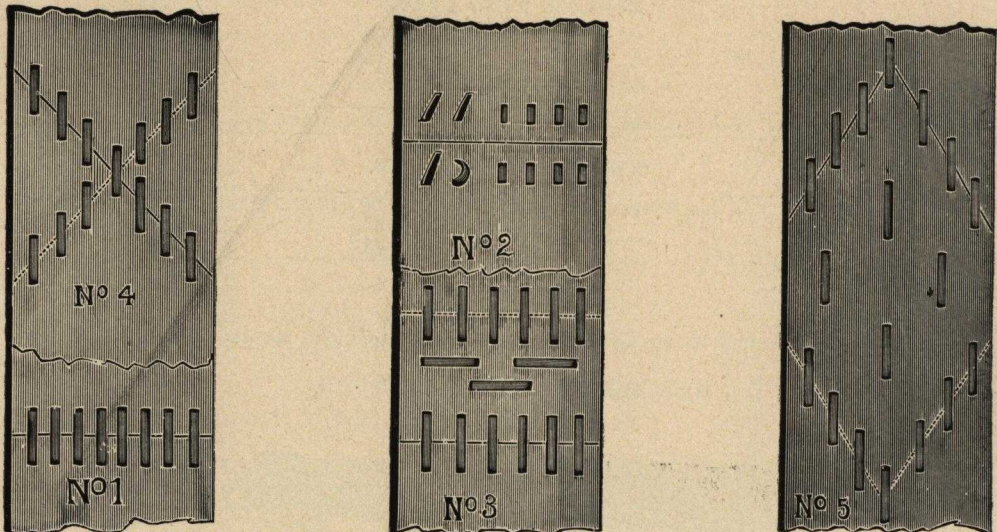
ELLIOTT'S "1880" LACE CUTTER.

(Patented September 3, 1878. Improved May 1, 1880.)

Will cut to a uniform width any leather up to $\frac{1}{2}$ inch in thickness, and from 3-16 to $\frac{3}{4}$ wide.

Price per dozen, . \$6 00.

COVEL'S IMPROVED BELT FASTENERS.



The above cuts illustrate the best belt fastenings ever used. No. 1 is a square butted joint shown on the outside of the belt. No. 2 shows the inside with part of the points clinched down. No. 3 shows a lap joint with the fasteners across the edges; they can also be used in the center in place of rivets as shown. No. 4 is a diagonal lap or splice. No. 5 represents a V splice.

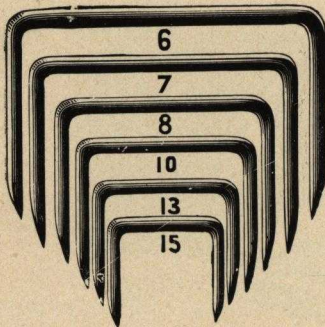
These fasteners are short and can be used on small fast speed pulleys, being much stronger than hooks or studs that are commonly used; are much more durable; producing less strain on belt. They punch their own holes as they are driven through the belt, and causes every fastener to draw alike, rendering an even strain on belt, and the belt will run smoother than from any other fastener.

They are made in three sizes, Nos. 1, 2 and 3.

Price of the above, \$2.50 per 1,000, or put up in boxes of 200 in each at 50 cents. Sample boxes of 200 fasteners sent by mail on receipt of price to any address.

THE BUFFALO BELT FASTENERS.

SIMPLE, PRACTICAL, CHEAP.

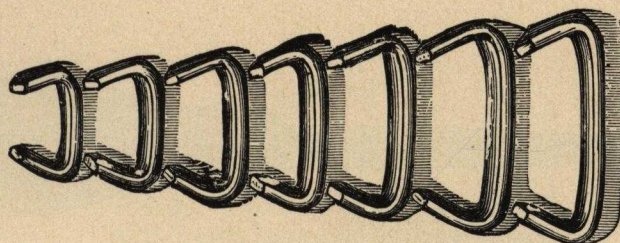


Price List per 1,000.

No. 15, 1,000 in a box	\$1 50
No. 13, 1,000 " "	2 00
No. 10, 1,000 " "	2 50
No. 8, 500 " "	3 50
No. 7, 250 " "	4 00
No. 6, 250 " "	5 00

SIZES TO USE.

For light, single and very small belts use No. 15. For ordinary single belts and general use use No. 13. For extra heavy and wide single belts, and for small and light double belts use No. 10. Nos. 13 and 10 may also be used on smaller sized 3 and 4-ply rubber and cotton belts. For ordinary double belts and wide 4-ply rubber and cotton use No. 8. For extra heavy and wide double leather and rubber belts Nos. 6 or 7 should be used.



POINTED BELT HOOKS.

Oval Pointed Belt Hooks are a cheap and good fastening for Belts. The sizes and prices per 1,000 are as follows, beginning with the smallest :

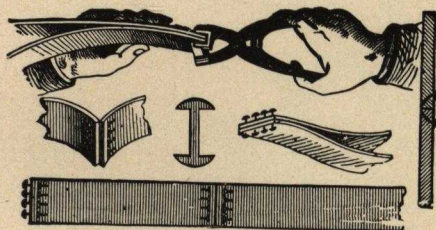
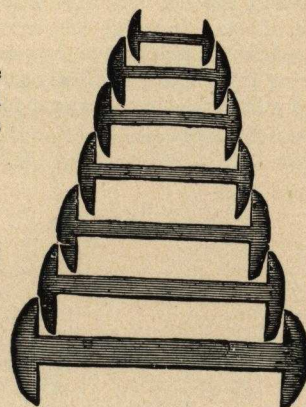
PRICE LIST OF POINTED BELT HOOKS.

No. 1.....	per 1000, \$30 00	No. 9.....	per 1000, \$4 00
No. 2.....	" 20 00	No. 10.....	" 3 50
No. 3.....	" 16 00	No. 11.....	" 3 00
No. 4.....	" 14 00	No. 12.....	" 2 80
No. 5.....	" 11 00	No. 13.....	" 2 60
No. 6.....	" 8 50	No. 14.....	" 2 40
No. 7.....	" 6 00	No. 15.....	" 2 00
No. 8.....	" 5 00		

PATENT BELT STUDS.

Blake's Belt Studs are largely used for fastening belts. The slits for these studs should be $\frac{1}{4}$ inch from the ends of the belts and $\frac{1}{2}$ inch apart. The sizes run from No. 00 for the largest double belts to No. 6 for sewing machine belts and the like.

No. 00.....	per 100, \$2 50
No. 0.....	" 2 00
No. 1.....	" 1 65
No. 2.....	" 1 25
No. 3.....	" 90
No. 4.....	" 80
No. 5.....	" 70
No. 6.....	" 60



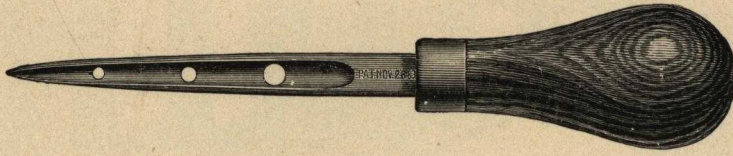
BELT CUTTERS, ETC.

Cutters for Rubber Belts.....	\$1 25
Cutters for Leather Belts.....	90
Awls to Spread the Slit.....	25

ROUND BELT, or DRIVE PUNCHES.



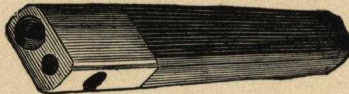
Nos. 1, 2, 3, 4, 5, Best Cast Steel,	per doz., \$ 2 00
" 6, 7, 8, 9, " " "	" 2 25
" 10, 12, 14, " " "	" 2 50

**LOTHROP'S PATENT BELT AWL.****DIRECTIONS FOR USING.**

For Single Leather belts, use no belt punch; the Awl will make the holes required. It will do the same in Double Leather, and rubber, with a little force behind it, but to use a small belt punch, in all but single leather belts, is not objectionable.

Push the Awl through the belt from either side, as required, until first or second hole, (whichever the size of lace used, may require,) of Awl is visible on the opposite side of the belt. Put end of lace through the hole in the Awl, pull Awl back, and lacing will come with it every time. Turning or twisting Awl to the right, it will cut hole, but turned to the left, it only swells it, without cutting. After a lace has been once through, any hole in the belt, do not turn Awl around in that hole, either way; simply push it straight through the hole, back of lace, insert lace in hole of Awl, and pull straight back again. By so doing, it leaves lace tight in the holes of belt, as in pulling through, the lace folds back into the grooves of the Awl, and does not therefore increase original size of hole any, in the belt, or require much strength, to pull it through. When belt is thoroughly laced, fasten ends of lace, by pushing the Awl through from outside of belt, (a little way back from lacing holes), until first hole nearest point of Awl is through, then insert lace in this hole of the Awl, and pull back. In this way the lacing is left secure, and will not likely get loosened.

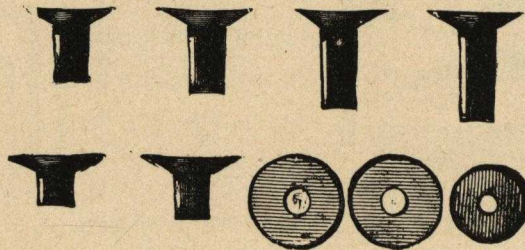
Price, 75 cents each.

RIVET SETS and HEADERS.**CAST STEEL EXTRA.**

Nos.	00 & 0,	1 & 2,	3 & 4,	5 & 6,	7 & 8,
Doz.	\$9 00	7 50	6 00	4 50	3 75

Half dozen in a box.

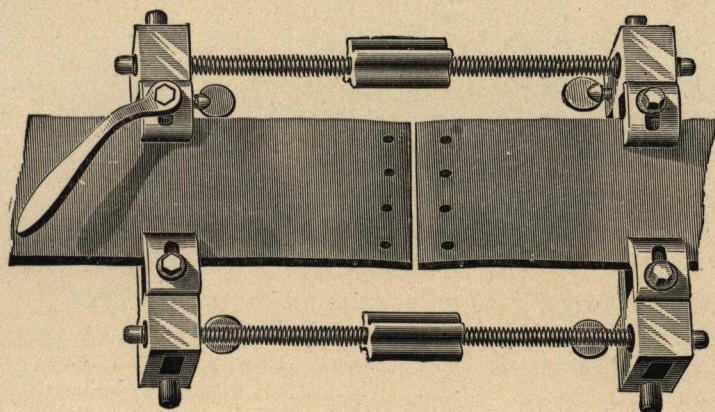
No. 2	is right size for Copper Rivet	No. 9.
No. 3	"	"
No. 4	"	"

COPPER RIVETS and BURS.

No. 7	Copper Rivets and Burs, per lb.,	49	cents.
No. 8	"	50	"
No. 9	"	52	"
No. 10	"	54	"
No. 12	"	58	"

BELT CLAMP.

THE PORTER BELT TIGHTENER.

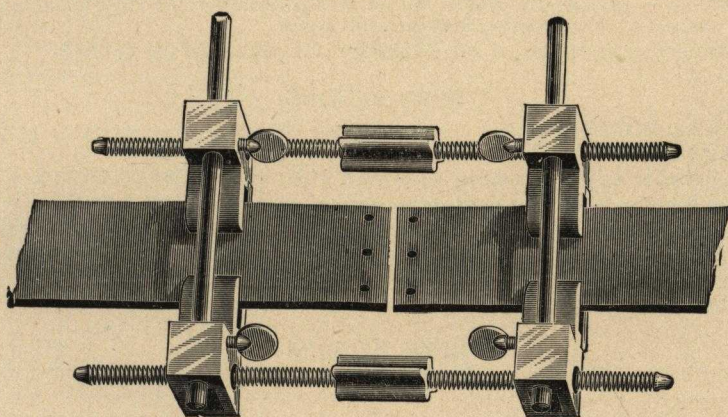


View of Top Side.

FOR DRAWING BELTS TOGETHER FOR THE PURPOSE OF LACING THE BELT.

The above cut represents one of the most complete and useful articles for those using belts of a width requiring to be drawn together and laced while upon the pulleys.

This clamp has proved itself indispensable to every establishment using belts 6 inches wide and upwards, and will soon pay its cost in saving of time in lacing belts quicker and better than any other way, and avoids any necessity or excuse for injuring a wide belt by putting it upon the pulley after it is sewed.



View of Under Side.

Price of Clasp to take a Belt from 2 to 20 inches wide, each	\$12 00
Price of Clasp to take a Belt up to 60 inches wide, each	15 00



MORRISON'S PATENT SELF-LUBRICATING PACKING.

Equally good for Steam, Hot or Cold Water, which cannot be said of any other packing now in the market. A trial will satisfy anyone of its merits. Price per lb.....50 cents.

GUM PACKING.

CLOTH INSERTION. CLOTH ON ONE OR BOTH SIDES.

	1-ply.	2-ply.	3-ply.	4-ply.
1-64 inch.....	\$0 70	....	....	....
1-32 ".....	65	....	....	....
1-16 ".....	60	0 63	0 66	....
3-32 ".....	55	58	61	....
$\frac{1}{4}$ ".....	....	55	58	0 61
3-16 ".....	....	....	55	58
$\frac{1}{2}$ ".....	....	....	....	55

One ply of cloth for every 1-16 inch, thickness,
Three cents per pound additional will be charged for each extra ply of cloth.

FIBROUS GASKETS or RINGS.

$\frac{1}{2}$ inch or less.....per lb., \$0 90 | 3-16 inch and upwards.....per lb. \$0 80

CLOTH INSERTION GASKETS and RINGS.

1-16 inch or less.....per lb., 1 25 | 3-32 inch and upwards.....per lb.. 1 00

There is one ply of cloth to every 1-16 inch thickness.
Five cents per pound additional will be charged for each extra ply of cloth.

PURE PACKING.

Pure Sheet Packing or Valve Gum.....per lb., 1 40
Pure Valves, Gaskets or Rings..... " 1 50

All cloth insertion or plain packing is one yard wide, and any length desired.
Pure sheet packing, about one yard wide, any thickness or length desired.
Round and Square Duck or Pure Gum Piston Packing is made in lengths of twelve feet.
Special orders for gaskets, valves &c. of any size or pattern that we do not keep on hand, can be executed within one week from receipt of order.
For cutting Rubber, use a sharp knife and keep it wet.

HEMP PACKING.

Numbers.....	2	1	Extra	Italian B.	Italian A.
Price, per pound	\$0 10	0 11	0 12	0 15	0 16
Soapstone packing, per pound.....	\$0 20				
Cotton Rope Packing, ".....	30				
Cotton Candle Wick, ".....	35				

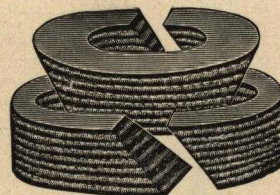
IMPROVED EXPANSION RING PACKING.



EXPANSION RING.



COIL RING.



SECTIONAL RING.

This packing is the result of much thought and experimenting by a practical engineer. In it there are combined three objects wished for by all engineers, i.e., durability, tightness and convenience. It has been thoroughly tested, and is now in use in many of the largest plants in the United States, as well as on lake and ocean steamships. We can assure you that one trial will convince you as to its merits.

Superiority is claimed over all other packings for the following reasons:

1st.—It is made a perfect fit for the rod and stuffing box, and is easily and quickly placed for use. (In ordering give exact size of box and rod.)

2nd.—It is made of the best cotton duck and rubber, manufactured expressly for our use.

3rd.—The lubricating qualities are forced into this packing by a patented process in Cold Oil, by hydraulic pressure, which thoroughly saturates the fibre without weakening the gum. The packing coming out tough and elastic, making it much more durable than other ring packings, all of which, so far as known, are subjected to a boiling process. It is a well-known scientific fact that hot oil destroys the life of rubber. Therefore, if you wish packing that has staying qualities, buy none but the CRANDALL IMPROVED.

The Automatic or Sectional Ring is designed for rods badly cut or out of center but should not be ordered unless rim of packing is $\frac{1}{2}$ inch or more in width.

HOW TO ORDER EXPANSION RING PACKING.

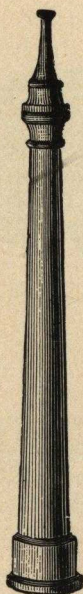
GIVE SIZE OF

Piston Rod.....	.....
Stuffing Box .....	.....
Depth Box.....	Quantity.....
Valve Rod.....	.....
Stuffing Box .....	.....
Depth Box	Quantity.....
Cut-off Rod.....	.....
Stuffing Box .....	.....
Depth Box	Quantity.....
Pump Rod .....	.....
Stuffing Box .....	.....
Depth Box	Quantity.....

NOTICE.—Be particular to give diameter of rod and box exact.

State if you wish the Sectional, otherwise the regular Expansion Ring will be sent.

Price per pound.....\$1 20



HOSE NOZZLES.
TO TIE ON. SOLID TIP.

Size.....	$\frac{3}{4}$	1
Price, per doz.....	\$ 3 50	4 50

HOSE PIPES.
WITH SCREW TIP.

Size....	$\frac{3}{4}$ x6	$\frac{3}{4}$ x8	$\frac{3}{4}$ x12	1x8	1x12	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
Price, per doz.	\$ 5 50	8 00	10 00	10 00	12 00	20 00	25 00	38 00

HOSE PIPES.
COCK ON LARGE END.

Size.....	$\frac{3}{4}$ x8	$\frac{3}{4}$ x12	1x8	1x12	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
Price, per doz..	\$13 00	18 00	15 00	20 00	40 00	55 00	110 00

HOSE COUPLINGS.

Size....	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Price, per doz.	\$ 2 40	2 40	4 40	10 00	14 00	24 00	48 00	75 00

One inch and over have gas pipe thread, unless otherwise ordered.

RUBBER HOSE.

Made with cotton duck manufactured expressly for the purpose. It is furnished in lengths of 50 feet, and of any size or strength required.

The sizes indicated in the list are the inner diameters, and each size will fully measure what it is marked.

CONDUCTING HOSE—Two Ply.

For conducting fluids under light pressure.

Size.....	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Price, per foot.....	\$ 0 20	0 25	0 33	0 42	0 50	0 66	0 83	0 99

HYDRANT HOSE—Three Ply.

This is intended for Hydrants, Garden and Force-Pump uses, where moderate pressure is required.

Size.....	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$
Price, per foot.....	\$ 0 25	0 30	0 40	0 50	0 60	0 80	1 00

ENGINE HOSE—Four Ply.

We recommend this when the pressure is about 150 lbs., and to this extent it will be found reliable.

Size.....	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	4
Price, per foot.....	\$ 0 30	0 37	0 50	0 62	0 75	1 00	1 25	1 50	2 00

"STANDARD LINEN HOSE."
(UNLINED AND SEAMLESS.)
IN LENGTHS OF 100 FEET.

1 inch diameter.....	per foot, 15 cents
1½ " "	" 18 "
1¾ " "	" 20 "
2 " "	" 22 "
2¼ " "	" 24 "
2½ " "	" 26 "
2¾ " "	" 28 "
3 " "	" 40 "
Fire Dep't size	" 28 "



RUBBER LINED "STANDARD LINEN HOSE."
(SEAMLESS AND CAPABLE OF GREAT RESISTANCE.)
IN LENGTHS OF 50 FEET ONLY.

1½ inch diameter	per foot, 45 cents.
1¾ " "	" 50 "
2 " "	" 55 "
2¼ " "	" 60 "
2½ " "	" 65 "
Fire Dep't Size	" 65 "

COTTON WASTE.

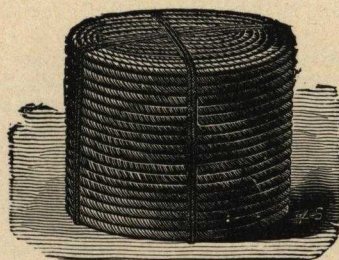


No. 1 White, per lb	cts.
" 2 " "	"
No. 1 Colored "	"
" 2 " "	"

LATH YARN.

Manilla per pound	Russia Hemp per pound
Sisal " "	American " "

MANILLA ROPE.



We furnish any size Rope at the lowest prevailing market prices.
Extra quality Tallow-laid Manilla Rope for steam feed, in stock at all times.

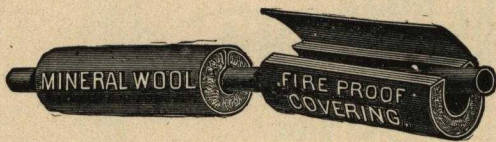
MINERAL WOOL SECTIONAL COVERING.

FOR STEAM PIPES AND BOILERS.

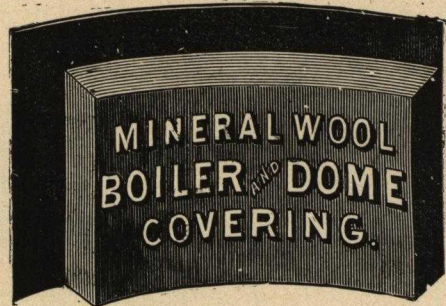
Best Non-Conductor for all Heat Surfaces, Steam or Fire Heat.

PIPE COVERING.

Made in sections three feet long, to fit any sized pipe. This cut represents one section applied and closed on the pipe, and the other section open, but about to be closed by folding and pasting down the lap.

**BOILER COVERING.**

Made in blocks 1½ inches thick of heavy asbestos sheathing, and filled with Mineral Wool.



It is absolutely indestructible by heat. It will not char like wool, powder like hair, nor crack like cement, nor burn like paper. It is easily and quickly applied and removed by any one. It is endorsed by insurance companies.

PRICES PER FOOT IN LENGTH.

Size of Pipe, inside diameter.....	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12 in.	
Paper Casing Canvas Covered.....	\$0	18	19	21	23	25	27	30	34	38	42	46	50	55	61	70	76	82	95
Asbestos Casing		18	19	21	23	25	27	30	34	38	42	46	50	55	61	70	76	82	95

For Boilers, drums, etc., 35 cents per square foot.

DESCRIPTION.

All covering is made with Asbestos Sheathing on the inside next the heated surfaces. The paper Casing Canvas Covered has an outer casing of heavy paper, with stout canvas fastened on the outside of each section.

The Asbestos Casing has Asbestos outside as well as inside, and is especially recommended where the covering is subject to outside heat, as in rolling mills, or where a Pipe passes near a Boiler.

When ordering Covering for Wrought Iron Pipe, give inside diameter; for Cast Iron, Copper and all other Pipes, give outside diameter.

In ordering Covering for Boilers, Domes, etc., give the number of square feet which are to be covered. State whether surface is flat or curved; if curved, give diameter of circle. For Domes, Drums, etc., state whether ends and tops are to be covered or not.

MINERAL WOOL IN BULK.

For lining cold storage warehouses.

For deadening floors, partitions and walls.

For packing and ice houses, dwellings.

For packing around Water and Steam Pipes.

It is indestructible by heat; is Sound-proof and Vermin-proof; clean, light dry and inodorous.

Ordinary Wool, weight, 14 pounds per cubic foot, 1½ pounds per square foot, 1 inch thick,

Price, per 100 pounds, in small lots.....\$1 25

Selected Wool, weight, 10 pounds per cubic foot, 1½ pound per square foot, 1 inch thick,

Price, per 100 pounds, in small lots.....2 00

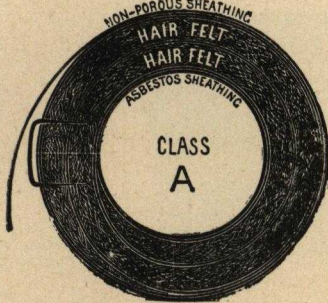
Extra Wool, weight 6 pounds per cubic foot, ½ pound per square foot, 1 inch thick,

Price, per 100 pounds, in small lots.....3 50

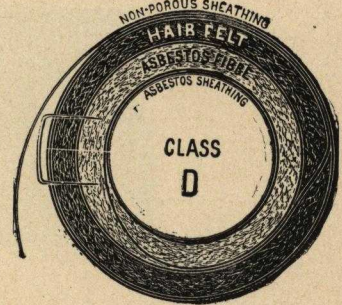
Package.—The material is packed in three-bushel burlap bags, holding four cubic feet of Mineral Wool. A uniform charge of ten cents each is made for bags. If returned to us free of all expenses (freight prepaid), and in good order, the amount paid for them will be remitted to purchaser. This privilege of allowance for empty bags is only open for sixty days after receipt of goods.

Send for sample and descriptive pamphlet.

CHALMERS-SPENCE COMPANY'S REMOVABLE COVERINGS.



FOR STEAM PIPES.



Inside diameter of Pipe.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12 in.							
Outside diameter of Pipe.....	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{5}{8}$	$1\frac{7}{8}$	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{5}{8}$	$3\frac{1}{8}$	$3\frac{3}{8}$	$4\frac{1}{8}$	$4\frac{3}{8}$	$5\frac{1}{8}$	$5\frac{3}{8}$	$6\frac{1}{8}$	$6\frac{3}{8}$	$7\frac{1}{8}$	$7\frac{3}{8}$	$8\frac{1}{8}$	$8\frac{3}{8}$	$9\frac{1}{8}$	$9\frac{3}{8}$	$10\frac{1}{8}$	$10\frac{3}{8}$	13
Per lineal ft. of Covering.....	\$0	19	20	21	24	25	27	31	36	40	42	46	50	56	64	69	76	84	97						
Special sizes at proportionate prices																									

Special sizes at proportionate prices.

This Covering is made in sections of three feet each in length, and of size to fit any diameter of Pipe.

Each section is cut longitudinally on one side, and will easily slip on the Pipe.

The Joint is held together by staples and covered with the flap which is secured by paste. (As shown in cut.)

This Covering is ready made, and involves no loss of time or waste of materials in applying.

Any one can put it on, and a handy mechanic can make a neat and durable job with little or no trouble.

This is an important consideration to those far distant from large cities, who must of necessity apply the Covering themselves.

We manufacture this Covering with great care, using pure and specially selected material.

It is the best non-conductor of heat of its kind known. It is light in weight, and will not sag or strain the Pipes. It will not crack or break under jar of vibration.

The use of Asbestos Fibre as a filling, in place of hair felt or other perishable materials, is a new and important feature. Since our introducing it in these Coverings it has met with universal favor. Hair felt will in time char and become worthless, while Fibrous Asbestos retains its form and high non-conducting powers under long continued and intense heat.

DIRECTIONS FOR APPLYING.

1. Make paste of good wheat flour and rather thick.
2. Moisten flap of Covering with water until it is pliable and coat the inner side with paste.
3. Open a section of Covering at one end with both hands, and slip it over the Pipe to be covered. Draw edges snugly together and paste flap firmly in position. On large sizes use a strap of rope with noose.
4. Place the next section on Pipe and drive the abutting joints snugly together.
5. Paste the strips with brush and wrap one layer around each abutting joint.
6. The staples sent with each shipment are for use only when the position of the Pipe prevents the section staying in place through the use of paste alone.

STANDARD LAP WELDED BOILER TUBES.



Outside Diam. Inches.	Price Per Foot.	Thickness Inches.	Thick-ness nearest Bgm. W. G.	Nominal Weight Per Foot.	Outside Diam. Inches.	Price Per Foot.	Thickness Inches.	Thick-ness nearest Bgm. W. G.	Nominal Weight Per Foot.
1	\$0 37	.095	13	90	4½	\$0 62	.134	10	6.17
1¼	35	.095	13	1.15	5	72	.148	9	7.58
1½	31	.095	13	1.40	6	1 00	.165	8	10.16
1¾	28	.095	13	1.66	7	1 45	.165	8	11.90
2	26	.095	13	1.91	8	1 85	.165	8	13.65
2¼	29	.095	13	2.16	9	2 25	.180	7	16.76
2½	32	.109	12	2.75	10	2 75	.203	6	21.00
2¾	36	.109	12	3.04	11	3 25	.220	5	25.00
3	39	.109	12	3.33	12	3 55	.229	4½	28.50
3¼	43	.120	11	3.96	13	4 20	.238	4	32.06
3½	45	.120	11	4.28	14	4 75	.248	3½	36.00
3¾	47	.120	11	4.60	15	5 75	.259	3	40.60
4	54	.134	10	5.47	16	6 75	.270	2½	45.20

The above prices are for tubes up to 20 feet long—for tubes in excess of that length, ten per cent. will be added to net of invoice.

Extra thickness of tubes will be charged as per list of extra gauges.

Order these by outside diameter.

EXTRA WIRE GAUGES.

For extra wire gauge boiler tubes, away from standard, not exceeding four wire gauges, add one and one-half cents for each inch in diameter to the list price per foot for each additional number.

To calculate price, take discounts from list prices of regular tubes and add net charge for extra wire gauge.

For One Number.	For Two Numbers.	For Three Numbers	For Four Numbers.
2 inch 2 cents.	2 inch 4 cents.	2 inch 6 cents.	2 inch 8 cents.
2¼ " 2¼ "	2¼ " 4½ "	2¼ " 6¾ "	2¼ " 9 "
2½ " 2½ "	2½ " 5 "	2½ " 7½ "	2½ " 10 "

SAFE ENDS.

Over 6 inches long, the extra length will be charged for in same proportion.

Size.....inches,	1	1½	1½	1¾	2	2¼	2½	2¾
Each end.....net,	\$0 13	0 13	0 13	0 13	0 13	0 14	0 16	0 18
Size.....inches,	3	3¼	3½	3¾	4	4½	5	6
Each end.....net,	\$0 20	0 22	0 25	0 27	0 29	0 32	0 37	0 45

WROUGHT IRON PIPE.

(Standard.)

Plain and Galvanized, for Gas, Steam or Water.



1½ inch and below, butt welded; proved to 300 pounds per square inch, hydraulic pressure.

1½ inch and above, lap welded; proved to 500 pounds per square inch, hydraulic pressure.

Nominal Size Inside Diameter.	Price per Foot, Black.	Price per foot, Galvanized.	Actual Outside Diameter.	Thickness.	Nominal Weight per Foot.	No. of Threads per Inch of Screw.	Price for Extra Cuts or Threads.
Inches.			Inches.	Inches.	Pounds.		
1	\$ 04	\$ 05	.40	.068	0.24	27	\$ 06
1 1/4	04	05	.54	.088	0.42	18	06
1 1/2	04 1/2	05 1/2	.67	.091	0.56	18	06
1 3/4	06	08	.84	.109	0.84	14	06
2	07 1/2	10	1.05	.113	1.12	14	06
2 1/4	11	14	1.31	.134	1.67	11 1/2	08
2 1/2	14 1/2	19	1.66	.140	2.24	11 1/2	09

LAP-WELDED.

Nominal Size Inside Diameter.	Price per Foot, Black.	Price per Foot, Galvanized.	Actual Outside Diameter.	Thickness.	Nominal Weight per Foot.	No. of Threads per Inch of Screw.	Price for Extras Cuts or Threads.
			Inches.	Inches.	Pounds.		
1 1/2	\$ 24	\$ 28	1.9	.145	2.68	11 1/2	\$ 10
2	33	38	2.37	.154	3.61	11 1/2	15
2 1/2	50	57	2.87	.204	5.74	8	25
3	64	70	3.5	.217	7.54	8	30
3 1/2	76	90	4.	.226	9.00	8	35
4	90	1 05	4.5	.237	10.66	8	45
4 1/2	1 06	1 31	5.	.247	12.34	8	55
5	1 28	1 60	5.56	.259	14.50	8	60
6	1 65	2 00	6.62	.280	18.76	8	80
7	2 10	.....	7.62	.301	23.27	8	1 25
8	2 75	.....	8.62	.322	28.18	8	1 60
9	3 75	.....	9.68	.344	33.70	8	2 50
10	4 75	.....	10.75	.366	40.00	8	3 00
11	6 00	.....	11.75	.375	45.00	8	3 50
12	7 00	.....	12.75	.375	49.00	8	4 00
13	8 00	.....	14.	.375	54.00	8	4 50
14	9 50	.....	15.	.375	58.00	8	5 00
15	11 00	.....	16.	.284	62.00	8	6 00

Pipe cut to specified lengths to suit purchasers at an extra charge.

WROUGHT IRON WELDED PIPE.

Table of Standard Dimensions and Prices.

EXTRA STRONG.

SIZE.	Price per Foot.	Actual Outside Diameter.	Nominal Inside Diameter.	Thickness.	Nominal Weight per Foot.
$\frac{1}{8}$	\$.08	.40	.205	.100	.29
$\frac{1}{4}$	.08	.54	.294	.123	.54
$\frac{3}{8}$	.09	.67	.421	.127	.74
$\frac{1}{2}$	.12	.84	.542	.149	1.09
$\frac{3}{4}$	.15	1.05	.736	.157	1.39
1	.22	1.31	.951	.182	2.17
1 $\frac{1}{4}$	.29	1.66	1.272	.194	3.00
1 $\frac{1}{2}$	.48	1.90	1.494	.203	3.63
2	.66	2.375	1.933	.221	5.02
2 $\frac{1}{2}$	1.00	2.875	2.315	.230	7.67
3	1.28	3.50	2.892	.304	10.25
3 $\frac{1}{2}$	1.52	4.00	3.358	.321	12.47
4	1.80	4.50	3.818	.341	14.97
5	2.56	5.563	4.813	.375	20.54
6	3.30	6.625	5.750	.437	28.58

DOUBLE EXTRA STRONG.

SIZE.	Price per Foot.	Actual Outside Diameter.	Nominal Inside Diameter.	Thickness.	Nominal Weight per Foot.
$\frac{1}{2}$	\$.24	.84	.244	.298	1.70
$\frac{3}{4}$	.30	1.05	.422	.314	2.44
1	.44	1.31	.587	.364	3.65
1 $\frac{1}{4}$	.58	1.66	.885	.388	5.20
1 $\frac{1}{2}$	.96	1.90	1.088	.406	6.40
2	1.32	2.375	1.491	.442	9.02
2 $\frac{1}{2}$	2.00	2.875	1.755	.560	13.68
3	2.56	3.50	2.284	.608	18.56
3 $\frac{1}{2}$	3.04	4.00	2.716	.642	22.75
4	3.60	4.50	3.136	.682	27.48
5	5.12	5.563	4.063	.75	38.12
6	6.60	6.625	4.875	.875	53.11

The outside diameters of extra strong and double extra strong are always the same as ordinary wrought iron pipe. The extra thickness always decreases the inside diameter.

Extra strong and double extra strong pipe is always shipped with plain ends unless otherwise specified.

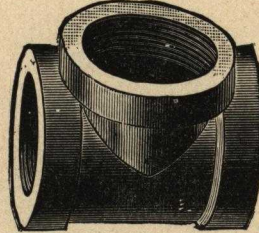
Extra and double extra strong pipe cut to specific lengths at an advanced price.

Threads and sockets on extra strong and double extra strong pipe will be charged extra.

Pipes heavier than the standards of extra strong or double extra strong pipe will be classed as "Hydraulic" and sold by the pound. Prices on application.

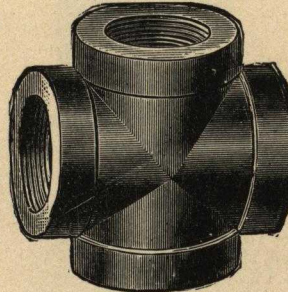
FITTINGS FOR WROUGHT IRON PIPE.

TEE.



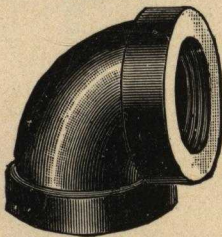
Size.....	inches,	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4
Cast Iron, R. H.....	each,	\$0 06	07 09	13	20 30	38	60	1 10	1 50	2 00	2 50
Cast Iron, Reducing, R. H.....	"		11 15	23 35	44		70	1 25	1 75	2 30	2 90
Malleable Iron, R. H.....	"	07	07 08	11 15	25 30	45	60	1 05	1 70	2 50	3 00
Malleable Iron, Galvanized, R. H.....	"		09 10	16 20	38 50	70	1 00	1 90	3 00	4 25	5 75
Size.....	inches,	4 $\frac{1}{2}$	5	6	7	8	9	10	12		
Cast Iron, R. H.....	each,	\$3 50	4 00	5 50	10 00	15 00	20 00	25 00	45 00		
Cast Iron, Reducing, R. H.....	"	4 00	4 60	6 35	11 50	17 00	23 00	30 00	50 00		

CROSS.

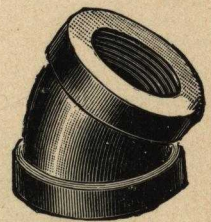


Size.....	inches,	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4
Cast Iron, R. H.....	each,	\$0 12	18	28	40	50	80	1 50	2 20	2 70	3 50		
Cast Iron, Reducing, R. H.....	"		14	21	32	46	58	92	1 70	2 50	3 00	4 00	
Malleable Iron, R. H.....	"	\$0 08	10	12	20	30	40	60	1 00	1 75	3 00	3 25	5 25
Size.....	inches,	4 $\frac{1}{2}$	5	6	7	8	9	10	12				
Cast Iron, R. H.....	each,	\$5 00	5 70	7 80	14 00	20 00	26 00	40 00	60 00				
Cast Iron, Reducing, R. H.....	"	6 00	6 60	9 00	16 00	23 00	30 00	46 00	70 00				

ELBOW.



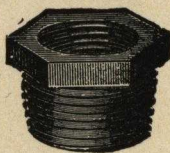
45 DEGREE ELBOW.



Size.....	inches,	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4
Cast Iron, R. H.....	each,	\$0 04	05 06	09 13	20 25	40	75	1 10	1 35	1 80	
Cast Iron, R. and L.....	"		05 06	07 11	16 23	29 46	85	1 25			
Cast Iron, Reducing, R. H.....	"			07 11	16 23	29 46	85	1 25	1 50	2 10	
Malleable Iron, R. H.....	"	\$0 04	04 06	10 15	22 25	35 50	80	1 50	2 25	3 00	
Malleable Iron, R. and L.....	"		05 09	12 17	25 30	40 65					
Malleable Iron, Galvanized, R. H.....	"		05 08	14 20	32 40	60 90	1 35	2 60	3 75	5 00	
Cast Iron, 45-degree Elbows.....	"		10 10	15 20	26 35	50	1 30	1 60	1 90	2 50	
Size.....	inches,	4 $\frac{1}{2}$	5	6	7	8	9	10	12		
Cast Iron, R. H.....	each,	\$2 50	2 85	3 90	7 00	10 00	13 00	20 00	30 00		
Cast Iron, Reducing, R. H.....	"	3 00	3 25	4 50	8 00	11 50	15 00	23 00	35 00		
Cast Iron, 45-degree Elbows.....	"	3 50	4 50	5 50	9 00	12 00	15 50	22 00	33 00		

FITTINGS FOR WROUGHT IRON PIPE.

BUSHINGS.



Size.....inches,	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Cast Iron, reducing more than one size, each,	.....	06	07	09	13	17	27	42	60	80	1 00
Malleable Iron, reducing one size only.....	"	\$0 05	06	07	09	13	17	27	42	.....	.....
Malleable Iron, Galvanized.....	"	0 06	07	10	14	21	30	44	59	.....	.....

Size.....inches,	$4\frac{1}{2}$	5	6	7	8	9	10	12
Cast Iron, reducing more than one size, each,	\$1 50	1 85	2 50	3 75	5 50	6 50	7 50	10 00

REDUCERS.



Size.....inches,	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Malleable Iron.....each,	\$0 03	03	05	10	16	20	28	45	70	1 00	1 50	1 85
Malleable Iron, Galvanized.....	"	.....	08	15	25	35	45	75	1 05	1 65	2 40	3 05

Size.....inches,	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	10	12
Cast Iron.....each,	\$0 75	1 20	1 50	2 00	2 75	3 00	4 00	8 00	10 00	15 00	22 00

CAPS.



Size.....inches,	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Malleable Iron,.....each,	\$0 03	04	05	08	12	16	24	32	45	85	1 00	1 20
Galvanized.....	"	0 04	05	08	12	17	24	38	52	76	1 30	2 00

Size.....inches,	$4\frac{1}{2}$	5	6	7	8	9	10	12
Cast Iron.....each,	\$1 60	2 00	2 35	4 00	4 35	6 00	7 25	10 00

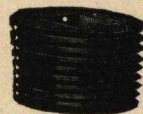
PLUGS.



SHOULDER.

Size.....inches,	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Cast Iron, each,	\$0 03	03	04	05	06	10	13	20	35	50	75	85	1 35	1 75	2 40	3 75	5 50	6 50	7 50	10 00

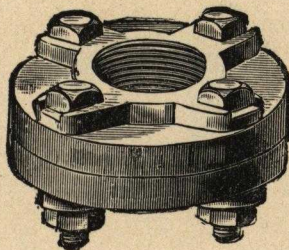
Size.....inches,	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	
Cast Iron, counter-sunk.....each,			06	07	09	11	15	22							
Cast Iron, Galvanized..... “	\$0 05	05	06	08	10	15	23	35	57	95	1 35	1 60	2 35	3 45	4 65



SOCKET.

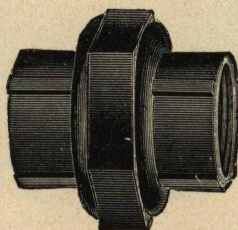
FITTINGS FOR WROUGHT IRON PIPES.

FLANGE UNIONS.



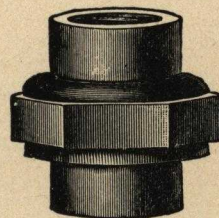
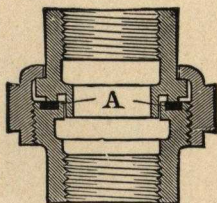
Size.....	inches.	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Each.....		\$0 65	0 70	0 85	1 15	1 50	1 75	2 25	2 75	3 15
Size.....	inches.	$4\frac{1}{2}$	5	6	7	8	9	10	12	
Each.....		\$4 50	5 00	6 50	8 00	10 00	12 50	15 00	23 00	

UNIONS—MALLEABLE IRON.



Size.....	inches.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	4	$3\frac{1}{2}$	4
Plain.....	each.	\$0 15	18	20	28	34	46	60	80	1 50	2 10	3 00	4 00
Galvanized.....	"	20	24	27	37	50	70	90	1 20	2 25	2 90	4 50	5 60

THE "AMERICAN" UNION.

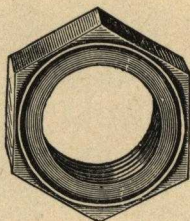


A glance at the "section" cut—"A"—will show the bed of anti-corrosive metal, and the manner in which the joint is made.

Size.....	inches.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Plain.....	each.	\$0 20	24	28	35	40	56	80	95	2 00	2 75
Galvanized.....	"	24	28	35	46	55	78	1 12	1 35	2 90	3 75

FITTINGS FOR WROUGHT IRON PIPE.

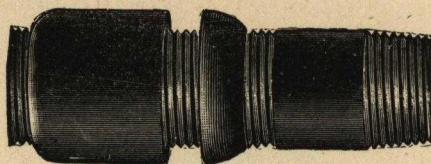
LOCK NUTS.



Size.....	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
Malleable Iron.....	each	\$0 02	03	04	05	07	09	11	18
Malleable Iron, Galvanized.....	"	03	04	05	07	10	14	20	30
Size.....	inches		2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	6
Cast Iron.....	each		\$0 40	50	70	95	1 25	1 35	1 90

LONG SCREWS.

WITH COUPLING AND LOCK NUT — FACED.



Size.....	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Standard length.....	"	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4 $\frac{1}{2}$	5	5 $\frac{1}{2}$	6	6 $\frac{1}{2}$	7	8
Each.....		\$0 30	35	40	55	75	1 00	1 30	1 70	2 70	3 70

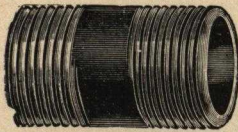
Long screws, longer than standard, made to order and charged as cut pipe. Threads couplings and lock nuts, extra.

COUPLINGS.



Size.....	inches.	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Wrought Iron, Plain, R. H.....	each.	\$0 05	05	06	07	10	13	17	21	28	40	60
Wrought Iron, Plain, R. and L.....	"	07	07	08	11	15	20	24	30	50	85	1 20
Wrought Iron, Galvanized, R. H.....	"	06	06	08	10	13	18	25	32	40	55	80
Wrought Iron, Plain, R. H., faced } for lock-nut joint..... }	"		09	10	12	16	22	30	40	50	70	90
Malleable Iron, R. H.....	"		03	04	07	10	14	20	25	35	.....	.....
Malleable Iron, Galvanized.....	"		05	07	10	17	23	30	40	55	.....	.....
Size.....	inches.	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	6	7	8	9	10	12	
Wrought Iron, Plain, R. H.....	each.	80	1 00	1 50	1 65	2 40	3 25	4 25	5 50	7 50	10 00	
Wrought Iron, Galvanized, R. H.....	"	1 05	1 40	2 00	2 25	3 25						

SHOULDER.



NIPPLES.

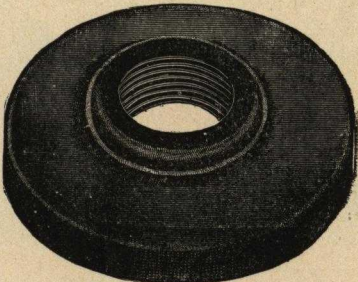
CLOSE.



Size, inches.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	6	7	8	9	10	12
Close or short.....	\$5	5	6	7	9	10	14	17	25	56	75	1 00	1 25	1 75	2 00	2 75	4 00	5 75	7 00	8 50	12 00
Assorted long.....	7	7	9	10	11	15	20	25	35	75	95	1 25	1 60	2 25	2 60	3 60					
When exact lengths are ordered.	5 in. lg.....	16	16	17	18	20	22	29	36	44											
	6 ".....	17	17	18	19	21	24	31	38	49	80	1 00					4 20	6 00			
	7 ".....	18	18	19	20	22	27	33	40	54	85	1 06	1 38	1 75	2 35	2 75	3 75	4 45	6 30	7 40	9 00
	8 ".....	19	19	20	21	23	29	35	42	59	91	1 15	1 50	1 92	2 45	2 95	3 90	4 70	6 60	7 80	9 60
	9 ".....	20	20	21	22	25	31	38	45	64	1 00	1 24	1 62	2 10	2 56	3 20	4 15	5 10	6 90	8 20	10 20
	10 ".....	21	21	22	23	27	33	40	48	69	1 10	1 34	1 74	2 30	2 75	3 45	4 40	5 50	7 20	8 80	11 00
	11 ".....	22	22	23	25	29	36	43	51	74	1 20	1 44	1 86	2 50	2 94	3 80	4 65	5 90	7 50	9 40	11 80
	12 ".....	23	23	25	27	31	40	46	55	79	1 30	1 55	2 00	2 70	3 15	4 20	4 90	6 30	7 80	10 00	12 60
Right & L. short....		10	10	12	15	18	24	30	40	1 00	1 25	1 50	1 75								
" " long.....		12	14	16	20	24	35	46	60	1 30	1 60	2 00	2 40								
Galv'zed, short....		7	8	9	11	13	17	23	32	65	1 00	1 25	1 45	1 90	2 40	3 50					
" " long.....		9	11	13	16	19	24	31	40	85	1 20	1 50	1 90	2 40	3 00	4 40					

Assorted long nipples will always be sent if not otherwise ordered.
Nipples with threads longer than standard, at special prices.

CAST IRON FLANGES.



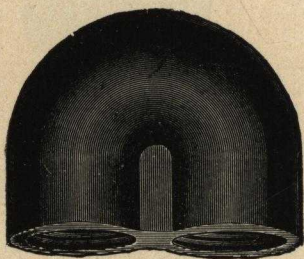
Size.....	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	6	7	8	9	10	12
Diam. 3 in.....	*\$ 14																		
" 3 $\frac{1}{2}$ ".....	17	*17	*18																
" 4 ".....	20	20	21	* 22	* 25														
" 4 $\frac{1}{2}$ ".....	26	26	28	28	30	* 31													
" 5 ".....	31	31	33	33	35	36													
" 5 $\frac{1}{2}$ ".....	40	40	40	42	42	45													
" 6 ".....	50	50	50	52	52	55	55												
" 6 $\frac{1}{2}$ ".....		55	60	62	62	62	65	65	65										
" 7 ".....			68	72	72	72	75	75	75	75									
" 7 $\frac{1}{2}$ ".....				80	80	80	80	80	84	87									
" 8 ".....					90	90	90	90	90	96	1 00	1 04							
" 8 $\frac{1}{2}$ ".....				1 00	1 00	1 00	1 00	1 00	1 08	1 13	1 22								
" 9 ".....					1 10	1 10	1 15	1 15	1 22	1 26	1 40	1 55	1 65						
" 9 $\frac{1}{2}$ ".....						1 20	1 25	1 30	1 37	1 55	1 58	1 70	1 80	2 20					
" 10 ".....							1 45	1 45	1 52	1 75	1 76	1 90	2 00	2 40					
" 10 $\frac{1}{2}$ ".....							1 65	1 65	1 69	1 85	1 96	2 10	2 20	2 60					
" 11 ".....							1 90	1 90	1 90	1 95	2 16	2 32	2 40	2 80					
" 11 $\frac{1}{2}$ ".....								2 00	2 12	2 25	2 36	2 54	2 60	3 00					
" 12 ".....								2 25	2 35	2 50	2 56	2 76	2 80	3 20	3 75	4 00			
" 13 ".....									2 60	2 85	2 85	3 00	3 05	3 45	4 10	4 50			
" 14 ".....											3 50	3 75	3 75	3 75	4 50	5 00	5 75	6 00	
" 15 ".....														4 25	5 00	5 60	6 25	6 60	
" 16 ".....															5 00	5 50	6 25	7 00	7 25
" 17 ".....																6 25	6 90	7 75	8 00
" 18 ".....																		9 25	10 75
" 19 ".....																			10 00
" 20 ".....																			11 00

Those marked * are drilled for screws. Circular Flanges made to order at double above price.

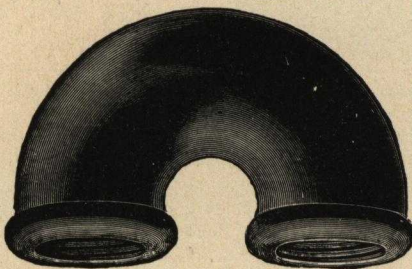
RETURN BENDS.

MALLEABLE IRON.

CLOSE PATTERN.



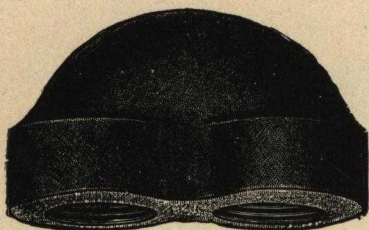
OPEN PATTERN.



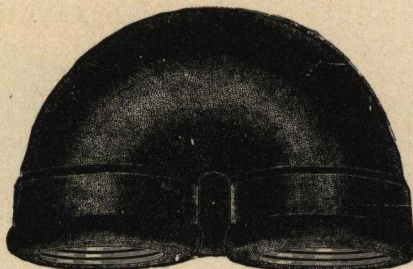
Size.....	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3 in.
Close Pattern, distance between centers.....	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2 $\frac{3}{16}$	2 $\frac{1}{8}$	.....	.....
Close Pattern, R. H., each.....	\$0 13	20	30	45	65	1 00	.....	.....
Close Pattern, R. & L., each.....	14	25	38	55	80	1 25	.....	.....
Close Pattern, R. H., Galvanized, each.....	25	35	45	70	1 05	1 65	.....	.....
Open Pattern, distance between centers.....	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{4}$	4	4 $\frac{1}{2}$	5 in.
Open Pattern, R. H., each.....	\$0 15	25	35	55	75	1 25	2 00	3 00
Open Pattern, R. & L., each.....	18	30	43	70	95	1 60	2 50	3 75

CAST IRON.

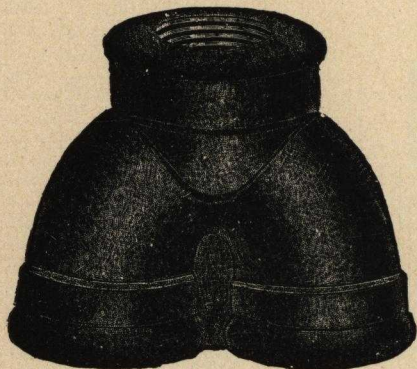
CLOSE PATTERN.



OPEN PATTERN.



Size.....	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3 in.
Close Pattern, distance between centers.....	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2 $\frac{1}{4}$	2 $\frac{1}{2}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	4 $\frac{1}{2}$ in.
Close Pattern, R. H., each.....	\$0 10	15	22	34	45	75	1 50	2 25
Close Pattern, R. & L., each.....	12	17	25	40	52	86	1 75	2 60
Open Pattern, distance between centers.....	1 $\frac{1}{2}$	2 $\frac{1}{8}$	3	3 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	in.
Open Pattern, R. H., each.....	\$0 20	30	48	68	1 15	1 75	2 75	3 75
Open Pattern, R. & L., each.....	.....	25	35	58	80	1 35	2 00	3 20

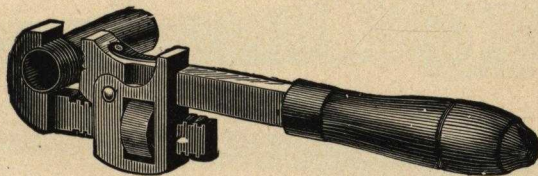
RETURN BEND, BACK
OUTLET.

CAST IRON.

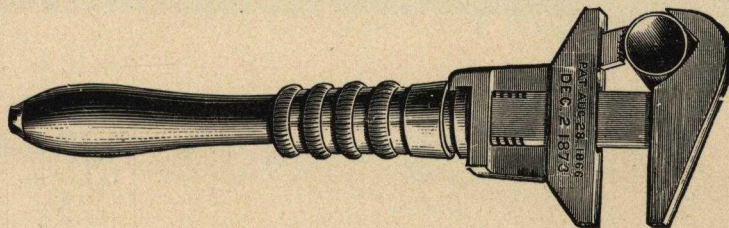
Size.....	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3 in.
Price, R. H., each.....	\$0 30	40	60	90	1 25	2 25	3 25
Price, R. & L., each.....	35	48	70	1 05	1 45	2 60	3 75

STILLSON'S PATENT WRENCH.

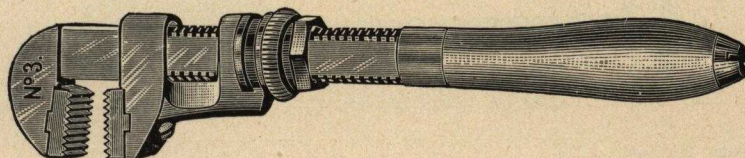
MADE OF THE BEST CAST STEEL.



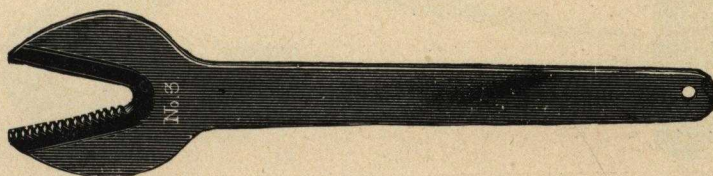
Length (open).	6,	8,	10,	14,	18,	24,	36,	48 in.
Takes from	Wire. Pipe.	Wire. Pipe.	Wire. Pipe.	Wire. Pipe.	Wire. Pipe.	Wire. Pipe.	Pipe.	Pipe.
	$\frac{1}{8}$ to $\frac{1}{2}$	$\frac{1}{8}$ to $\frac{3}{4}$	$\frac{1}{8}$ to 1	$\frac{1}{4}$ to $1\frac{1}{2}$	$\frac{1}{4}$ to 2	$\frac{1}{4}$ to $2\frac{1}{2}$	$\frac{1}{2}$ to $3\frac{1}{2}$	1 to 5 in.
Each.....	\$2.00	2.00	2.25	3.00	4.00	6.00	12.00	18.00
Jaws.....	.67	.67	.75	1.00	1.33	2.00	4.00	6.00
Frames.....	.25	.25	.33	.44	.55	.65	.75	1.00
Nuts.....	.20	.20	.27	.35	.42	.50	.65	.80

BEMIS & CALL'S COMBINATION WRENCH.

Bright, 10 inch, adjustable to pipe from	$\frac{1}{2}$ to 1 inch	per doz.	Short Nut.	Long Nut.
" 12 " " " " "	$\frac{1}{2}$ to $1\frac{1}{2}$ "	"	\$23.00	\$25.25
" 15 " " " " "	$\frac{1}{2}$ to 2 "	"	26.00	28.50
			37.00	40.50

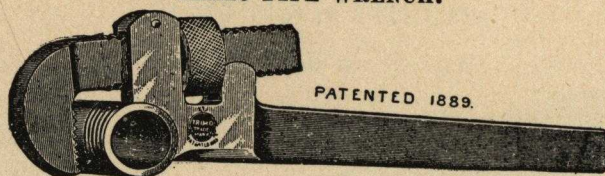
BEMIS & CALL'S No. 3 PIPE WRENCH.

10 inch, takes pipes from	$\frac{1}{2}$ to 1	per doz.	Short Nut.	Long Nut.
12 " " " " "	$\frac{1}{2}$ to $1\frac{1}{2}$ "	"	\$27.00	\$28.50
15 " " " " "	$\frac{1}{2}$ to 2 "	"	33.00	35.00
			37.50	40.00

THE ALLIGATOR WRENCH.

Number.....	1	2	3	4	5
Holds Pipe.....	$\frac{1}{2}$ to $\frac{3}{4}$	$\frac{3}{4}$ to $\frac{1}{2}$	$\frac{1}{2}$ to $1\frac{1}{2}$	$1\frac{1}{2}$ to 2	2 to 3 in.
Holds Round Iron.....	$\frac{1}{4}$ to $\frac{3}{4}$	$\frac{1}{2}$ to 1	$\frac{1}{2}$ to $1\frac{1}{2}$	$1\frac{1}{2}$ to $2\frac{1}{2}$	$2\frac{1}{4}$ to $3\frac{1}{2}$ in.
Length.....	$5\frac{3}{4}$	10	16	22	27 in.
Per dozen.....	\$4.00	12.00	24.00	36.00	54.00

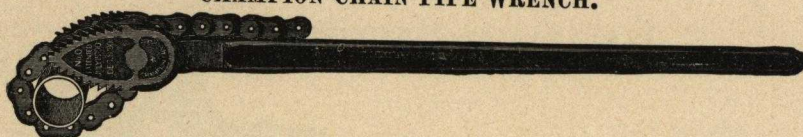
TRIMO PIPE WRENCH.



PRICE LIST.

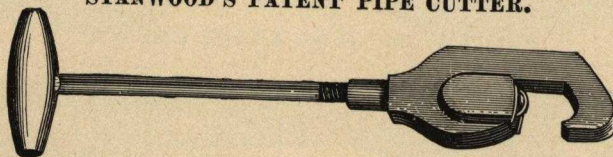
Length open, in inches.	6	8	10	14	18	24	36	48
Takes from.....	$\frac{1}{8}$ in. wire to $\frac{1}{2}$ in. pipe.	$\frac{1}{8}$ in. wire to $\frac{3}{4}$ in. pipe.	$\frac{1}{8}$ in. wire to 1 in. pipe.	$\frac{1}{4}$ in. wire to $1\frac{1}{2}$ in. pipe.	$\frac{1}{4}$ in. wire to 2 in. pipe.	$\frac{1}{4}$ in. wire to $2\frac{1}{2}$ in. pipe.	$\frac{1}{2}$ in. pipe to $3\frac{1}{2}$ in. pipe.	1 in. pipe to 5 in.
Price	\$2 00	\$2 00	\$2 25	\$3 00	\$4 00	\$6 00	\$12 00	\$18 00
Jaw	67	67	75	1 00	1 33	2 00	4 00	6 00
Nut	20	20	27	35	42	50	65	80
Inserted Jaw	25	25	33	50	55	65	1 00	1 25
Frame	25	25	33	45	55	65	75	1 00

CHAMPION CHAIN PIPE WRENCH.



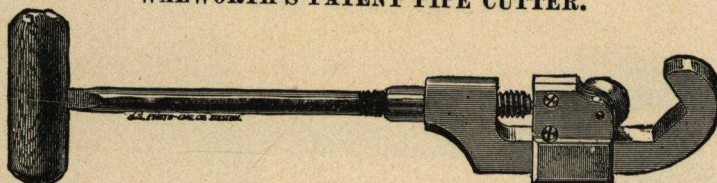
Size.....	No. 0.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Price.....	\$2 50	\$3 50	\$5 50	\$7 50	\$11 00	\$18 00
Capacity.....	$\frac{1}{8}$ to $\frac{3}{4}$ in.	$\frac{1}{8}$ to $1\frac{1}{2}$ in.	$\frac{1}{8}$ to $2\frac{1}{2}$ in.	$\frac{3}{4}$ to 4 in.	$1\frac{1}{2}$ to 8 in.	2 to 14 in.
Length.....	$12\frac{1}{2}$ in.	20 in.	27 in.	37 in.	50 in.	64 in.
Weight.....	$1\frac{1}{4}$ lbs.	$4\frac{1}{4}$ lbs.	8 lbs.	15 lbs.	28 lbs.	47 lbs.
Extra Chain, each..	\$0 75	\$1 00	\$1 50	\$2 50	\$4 00	\$6 00
Extra Jaws, pair.....	1 00	1 75	2 75	4 00	5 50	7 50

STANWOOD'S PATENT PIPE CUTTER.



Number.....	1	2	3
Cuts Pipe from, inches.....	$\frac{1}{8}$ to 1	1 to 2	2 to 3
Case Hardened, each.....	\$1 50	\$2 25	\$7 00
Steel Faced, each.....	1 75	2 50	7 50
Cutter Wheels, each.....	12	18	25
Cutter Blocks and Wheels, each.....	40	60	1 00

WALWORTH'S PATENT PIPE CUTTER.



Number.....	1	2	3
Cuts Pipe from, inches.....	$\frac{1}{8}$ to 1	1 to 2	2 to 3
Complete, each.....	\$1 50	\$2 25	\$7 00
Cutter Wheels, each.....	12	18	25
Cutter Blocks and Wheels, each.....	40	60	1 00

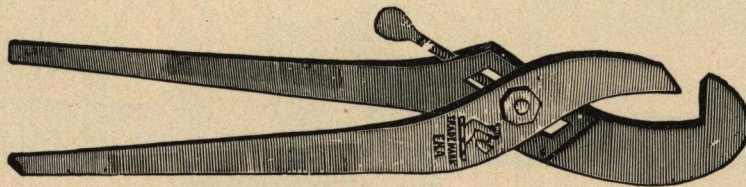
PIPE TONGS.

MADE EXTRA HEAVY AND STRONG.



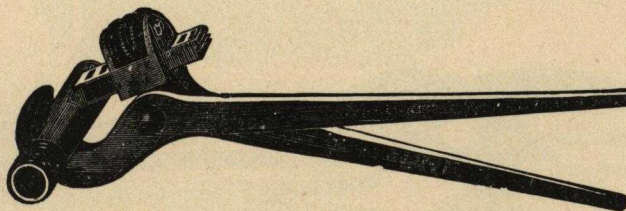
Size, in....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Each.....	\$0 60	65	70	75	90	1 10	1 30	1 50	1 90	2 50	4 25	5 25	6 25	9 00	11 00

BROWN'S ADJUSTABLE PIPE TONGS.



Number	1	$1\frac{1}{2}$	2	3	4	5	6	7
For Pipe—Size, in.....	$\frac{1}{8}$ to $\frac{3}{4}$	$\frac{3}{8}$ to 1	$\frac{1}{2}$ to $1\frac{1}{4}$	1 to 2	$1\frac{1}{2}$ to 3	$2\frac{1}{2}$ to 4	3 to 5	4 to 7
Each.....	\$1 30	1 65	2 00	3 00	6 00	11 00	25 00	35 00

JARECKI'S ADJUSTABLE PIPE TONGS.



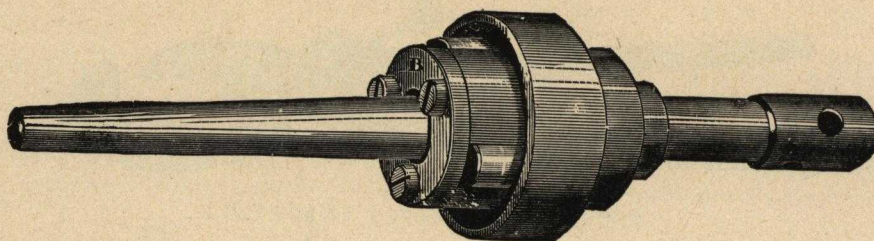
Number.....	0	1	2	3	4	5
Length, inches.....	12	15	24	30	34	55
Grips from.....	$\frac{1}{8}$ to $\frac{3}{4}$	$\frac{1}{8}$ to 1	$\frac{1}{4}$ to $1\frac{1}{2}$	$\frac{1}{2}$ to $2\frac{1}{2}$	$\frac{3}{4}$ to $3\frac{1}{2}$	$2\frac{1}{2}$ to 6
Each.....	\$3 00	3 50	4 00	5 00	9 00	16 00
Extra Tong Bits.....	30	30	50	75	1 00	2 50
“ Worm Wheels.....	30	30	50	60	75	1 50
“ Handles—Jaw or Hook part, each	1 00	1 00	1 25	1 50	1 75	3 00

COLLINS' TUBE EXPANDER.

Outside Diameter of Tube.....	1½	1¾	1⅞	2	2¼	2⅝ in.
Each.....	\$14 00	16 00	16 00	18 00	22 50	25 00
Outside Diameter of Tube.....	2½	2¾	3	3¼	3½	4 in.
Each	25 00	27 00	30 00	35 00	40 00	45 00

DIRECTIONS.

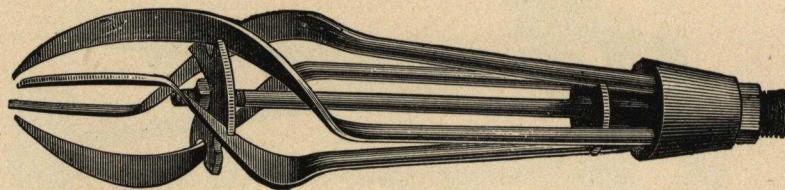
In using apply the power to the square end of the frame (3), or to the square end of the central spindle (2) and turn to the right, when the tool will feed itself and enter the tube, expanding it to the required dimensions with the greatest ease.

ROLLER TUBE EXPANDER.

Outside diam. of Tube, in.....	1	1¼	1½	1¾	1⅞	2	2¼	2½
Each.....	\$7 00	7 00	8 00	9 00	10 00	10 00	12 00	14 00
Outside diam. of Tube, in.....	2¾	3	3¼	3½	4	4½	5	6
Each.....	\$16 00	18 00	20 00	23 00	28 00	33 00	40 00	48 00

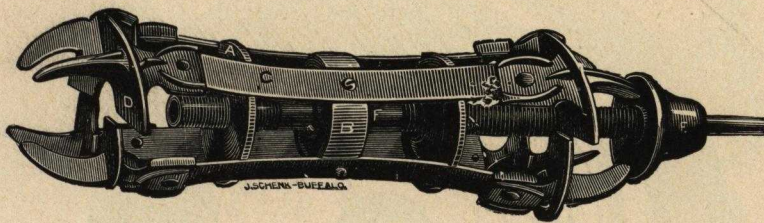
NATIONAL STEEL TUBE CLEANER.

SAVES FUEL. SAVES LABOR.



1 inch.....	\$1 00	3¼ inch.....	\$3 25
1½ ".....	2 00	3½ ".....	3 50
1¾ ".....	2 00	4 ".....	4 00
2 ".....	2 00	4½ ".....	4 50
2¼ ".....	2 25	5 ".....	5 00
2½ ".....	2 50	5½ ".....	7 00
2¾ ".....	2 75	6 ".....	7 50
3 ".....	3 00		

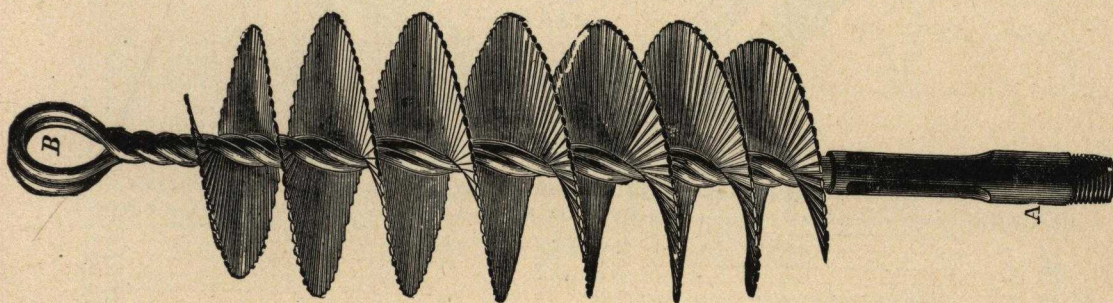
"ENGINEER'S FAVORITE" BOILER FLUE CLEANER.



This is the most perfect Flue Cleaner ever invented. By simply turning the rod or handle the ends contract until it will readily pass into the flue; then, by turning the handle in an opposite direction, the cleaner is gradually expanded until it fits tube perfectly.

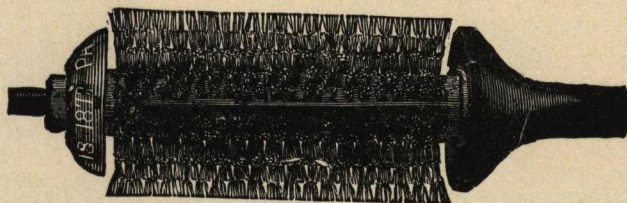
List price, per inch, sizes up to 4½, inclusive.....\$1 00
List price, per inch, sizes over 4½.....1 25

STILLWELL'S PATENT BOILER FLUE BRUSHES.



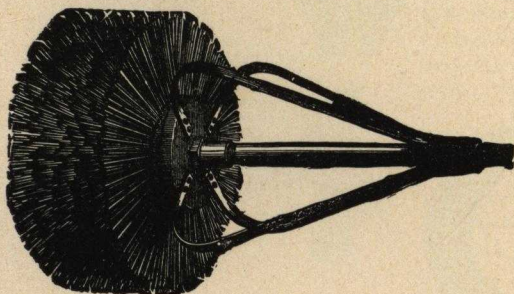
Size.....	1	1½	1¾	2	2½	3	3½	4	4½
Each.....	\$1 35	1 45	1 55	1 70	1 90	2 10	2 30	2 50	2 80
Size.....	3½	4	4½	5	5½	6	7	8	9
Each.....	\$3 00	3 30	3 75	4 00	4 25	4 50	4 75	5 50	

EXPANSION TUBE AND FLUE BRUSH.



This cut shows our Expansion Brush ready for use. It can be expanded ten or more times until the wire is worn out.

Price.....\$1 00 per inch.
Sizes smaller than 2 inches same price as 2 inch. Made in sizes from 1½ to 9 inches.



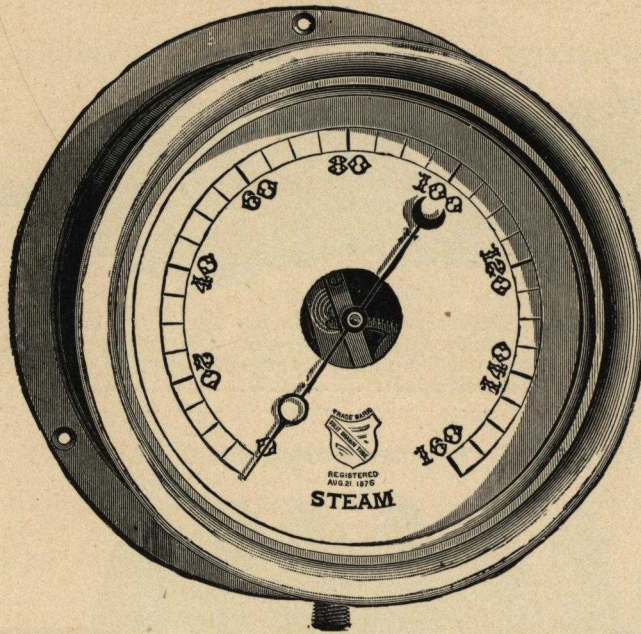
STEEL WIRE BRUSHES.

This cut shows our large Flue Brush. The braces at the end strengthen the brush and serve to slide the brush up into the flue again, in case it is pushed entirely through.

Price.....\$1 00 per inch.
Made in sizes, 6 inches to 36 inches.

In ordering Brushes, always give outside diameter of tubes.

STEAM GAUGES.
SOLID DRAWN SEAMLESS TUBE.



GAUGES OF 300 POUNDS PRESSURE OR LESS.

BRASS CASES LACQUERED, INCLUDING COCK.

12 inch dial	\$75 00
10 " "	40 00
8 1/2 " "	30 00
6 3/4 " "	20 00
6 " "	16 00
5 1/2 " "	12 00
4 1/2 " "	10 00
3 1/2 " "	9 00
3 " "	8 00
or smaller	8 00

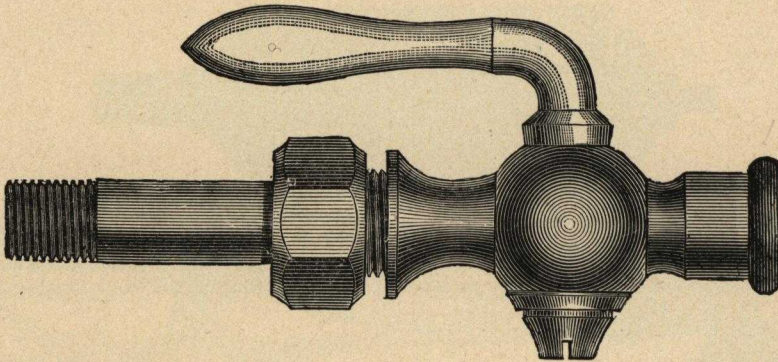
IRON CASES JAPANED, INCLUDING COCK.

12 inch dial	\$50.00
10 " "	32.00
8 1/2 " "	22.00
6 3/4 " "	16.00
6 " "	13.00
5 1/2 " "	10.00
4 1/2 " "	8.00
3 1/2 " "	7.00
3 " "	6.00
or smaller	6.00

Nos. 0 to 3 with Octagon Rings, \$1 50 extra. Nickel Plating extra, at cost.
No Gauge warranted unless properly connected with Syphon.

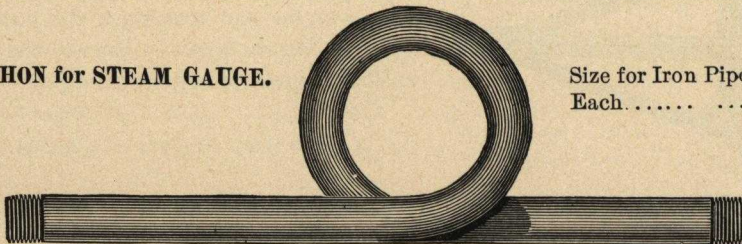
Gauges should indicate about double the working pressure.

COCKS FOR STEAM GAUGES.



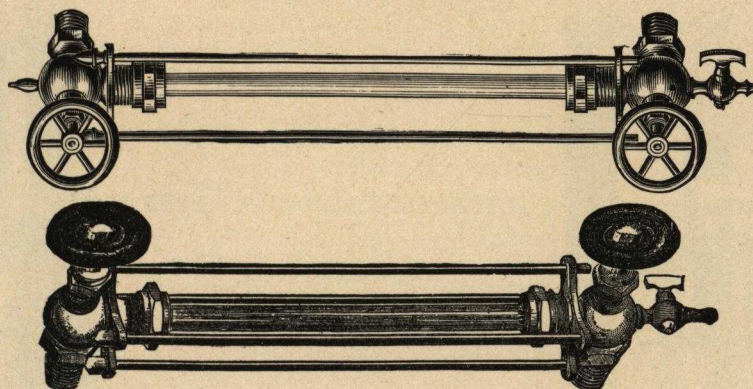
Size..... 1/4 in.
Finished each, 1 90

SYPHON for STEAM GAUGE.



Size for Iron Pipe,..... 1/4 in.
Each 0 50

WATER GAUGES.



With Two Guards.

	With Iron Wheels.	With Wood Wheels.
No. 1, Rough Body, Glass $\frac{1}{2}$ x 10 in., cut for $\frac{1}{2}$ in. iron pipe, each.	\$2 75	\$3 50
No. 2, Rough Body, Glass $\frac{1}{2}$ x 12 in., cut for $\frac{1}{2}$ in. iron pipe, each.	3 00	3 75
No. 3, Rough Body, Glass $\frac{1}{2}$ x 16 in., cut for $\frac{1}{2}$ in. iron pipe, each.	4 50	5 25

With Four Guards.

No. 15, Finished Body, Patent Wood Wheels, Glass $\frac{1}{2}$ x 12 in., cut for $\frac{1}{2}$ in. pipe, each.	\$6 00
No. 16, Finished Body, Patent Wood Wheels, Glass $\frac{1}{2}$ x 16 in., cut for $\frac{1}{2}$ in. pipe, each.	7 50

Rubber Gauge Glass Washers.

Per dozen.	\$ 60
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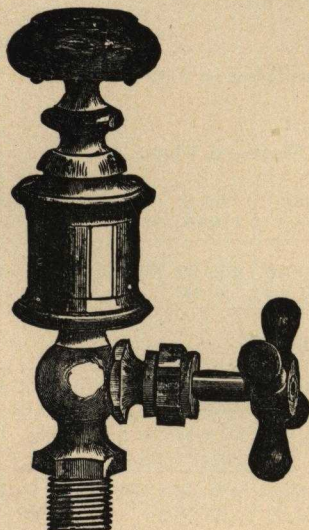
GENUINE SCOTCH GLASS TUBES.

NOT ILLUSTRATED.

Length, Inches,	External Diameter.					Length, Inches.	External Diameter.				
	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$		$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
10.....	4.80	4.80	6.60	8.40	10.80	19.....	9.00	9.00	9.60	11.40	13.20
11.....	4.80	4.80	6.60	8.40	10.80	20.....	9.60	9.60	10.20	12.00	15.00
12.....	5.40	5.40	6.60	8.40	10.80	22.....	10.80	10.80	11.40	15.00	18.00
13.....	5.40	5.40	6.60	8.40	10.80	24.....	12.00	12.00	12.60	18.00	24.00
14.....	6.00	6.00	7.20	8.40	10.80	30.....	16.00	16.00	18.00	24.00	31.20
15.....	6.60	6.60	7.20	9.00	10.80	36.....	20.00	20.00	24.00	30.00	39.00
16.....	7.20	7.20	7.80	9.60	10.80	48.....	24.00	24.00	36.00	48.00	60.00
17.....	7.80	7.80	8.40	10.20	11.40	60.....	.....	.....	.....	.....	84.00
18.....	8.40	8.40	9.00	10.80	12.00						

Size over 24 inches, special discount.

60 x 1 $\frac{1}{4}$ inches, \$112.00.



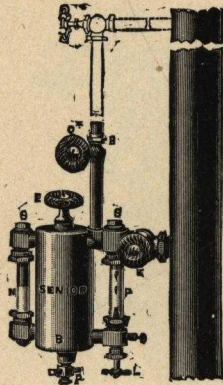
COMMON LUBRICATORS.

WOOD HANDLE.

Price List.

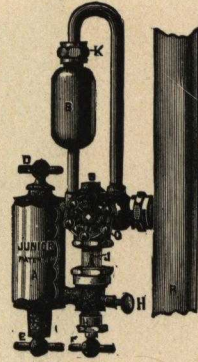
Number.....	1	2	3	4	5	6
Diameter.	$\frac{1}{2}$	1	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2 in.
Diameter of Blank Shank.	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$ in.
Cuts Iron Pipe, size.....	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Each..	\$1 75	2 00	2 20	2 40	2 60	2 90

Number.....	7	8	9	10	11
Diameter.....	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4 in.
Diameter of Blank Shank.	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$ in.
Cuts Iron Pipe, size.....	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Each.....	\$3 25	3 75	4 75	7 00	10 00



SENIOR.

**IMPROVED
AUTOMATIC STEAM SIGHT FEED
LUBRICATORS.**

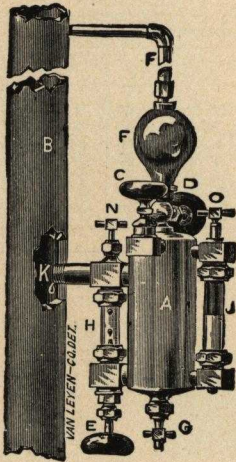


JUNIOR.

Size.	Suitable for Engine Cylinders	Plain Brass.	Nickle Plated.	Size.	Bronzed.	Plain Brass.	Nickle Plated.
$\frac{1}{2}$ Pint	6 to 10 inches	17 00	19 00	$\frac{1}{2}$ Pint	\$ 7 00	\$ 8 50	\$10 00
1 Pint	10 to 18 inches	22 00	25 00	$\frac{1}{2}$ Pint	8 00	10 00	11 50
1 Quart	18 to 30 inches	28 00	32 00	$\frac{1}{2}$ Pint	10 00	12 00	13 50
$\frac{1}{2}$ Gall.	30 and up	38 00	43 00	1 Pint	14 00	16 00	18 00

DETROIT SIGHT FEED LUBRICATOR.

Description.



- A. Oil Reservoir.
 - B. Steam Pipe.
 - C. Oil Filler.
 - D. Water Feed Valve.
 - E. Valve to regulate flow of oil.
 - F. F. Steam Tube and Condensing Chamber.
 - G. Drain Valve to draw off water, to prevent freezing, etc.
 - H. Sight Feed Glass.
 - J. Glass Indicator.
 - K. Oil Discharge Pipe.
 - N. Valve to correct Pulsation or unsteadiness in Feed.
 - O. Vent.
 - P. Water Pipe
 - S. Oil Conduit
- } Shown in No. 2, Sectional View.

Size.	Plain Brass.	Nickel Plated.	Suitable for Engine with Diam. Cyl., viz:	Size.	Plain Brass.	Nickel Plated.	Suitable for Engine with Diam. Cyl., viz:
Half Pint...	\$22 00	\$25 00	Up to 10 inches.	Half Gallon.	\$60 00	\$65 00	30 inches and over.
Pint.....	30 00	35 00	10 to 18 inches.	Gallon.....	75 00	80 00	.....
Quart.....	45 00	50 00	18 to 30 inches.				

DOUBLE SIGHT FEED LUBRICATORS.

Half Gallon.	\$75 00	\$80 00	Gallon.....	\$90 00	\$96 00
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PORTABLE ENGINE LUBRICATOR.

$\frac{1}{2}$ Pint.....	\$15 00	\$18 00	Without Gauge	$\frac{1}{2}$ Pint.....	\$22 00	\$25 00	Without Gauge
$\frac{1}{2}$ Pint.....	17 00	20 00	Glass.	1 Pint.....	30 00	35 00	Glass.

THE DIBBLE LUBRICATOR.

Principle of Operation.

Steam from the pipe S passes through the upper pipe to the bottom of tank D, filled with oil, where it condenses and forces the oil through the lower pipe to the indicator, and passes through the indicator into the steam pipe S to engine.

The Flow is regulated by the valve F.

To fill the tank close both globe valves, and remove plug at C, also open the valve at bottom of tank to remove the water.

To clean the Glass, close both globe valves, and remove the top of indicator.

TO OPERATE THE LUBRICATOR.

First fill the indicator with water, open valve S: then fill the oil tank full of oil, open valve C. You must have all joints tight before opening valve F, F will regulate the desired drop of oil.

Advantages of the Dibble Lubricator.

It will economize from 40 to 80 per cent. in oil by its perfect regularity and visible feed.

It will lessen the expense of maintaining your engine sufficiently to pay for itself every few months.

Your engine will give more power, because its internal friction will be almost entirely reduced.

Your Governor will be more sensitive.

Your Piston and Valve Steam Packing will wear much longer.

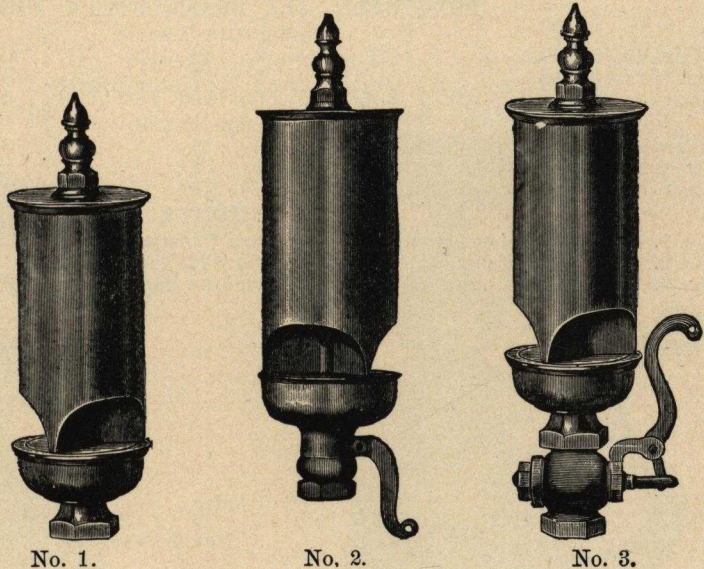
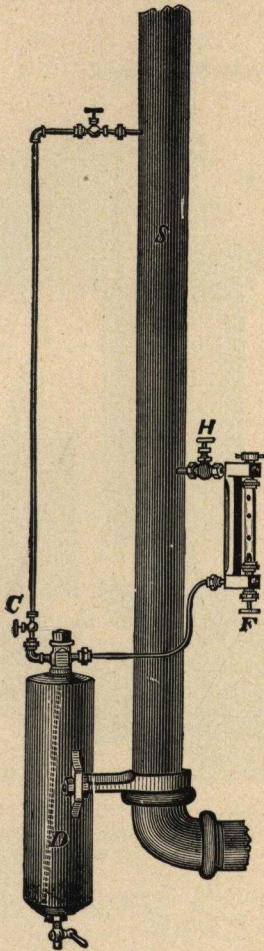
Your Piston and Valve Rods will not cut.

It is the simplest and most durable Lubricator made.

Thirty days trial given to responsible parties wishing to try the Lubricator. Perfect satisfaction guaranteed.

No. 1, $\frac{1}{2}$ Gallon,	\$30 00	Nickel Plated,	\$35 00
No. 2, 1 "	35 00	" "	40 00
No. 3, 8 "	60 00		

SINGLE BELL CHIME STEAM WHISTLE.



No. 1.

No. 2.

No. 3.

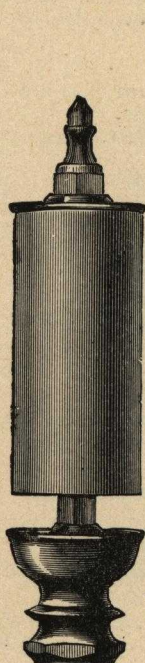
Diameter of Bell	2	3	4	5	6	8	10	12in.
Size Steam Pipe	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3in.
No. 1, without Valve	\$5 00	8 00	14 00	22 00	30 00	70 00	110 00	150 00
" 2, with upright Valve	6 50	9 50	16 00	25 00	35 00	85 00	130 00	180 00
" 3, with side Valve	7 00	11 00	18 00	28 00	38 00	90 00	140 00	200 00

The peculiar merit of this Whistle consists in producing three distinct tones pitched to the first, third and fifth of the common musical scale, which harmonize and give an agreeable musical chord.

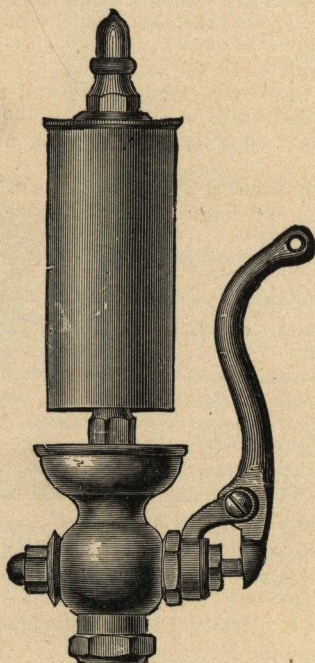
STEAM WHISTLES.

Long Bell, All Brass.

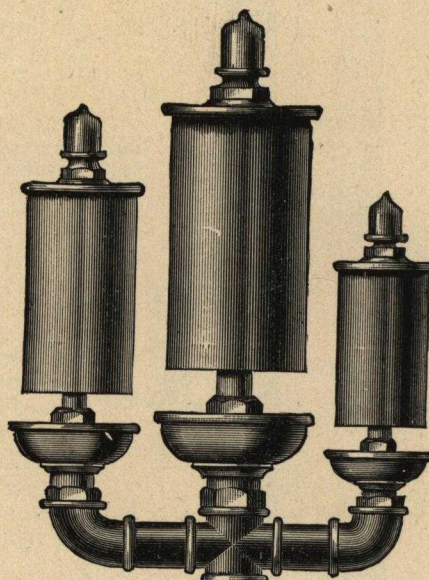
Whistle Chimes.



Without Valve.



With Valve.



Three Whistle Chimes, Correctly Tuned.

Price List.

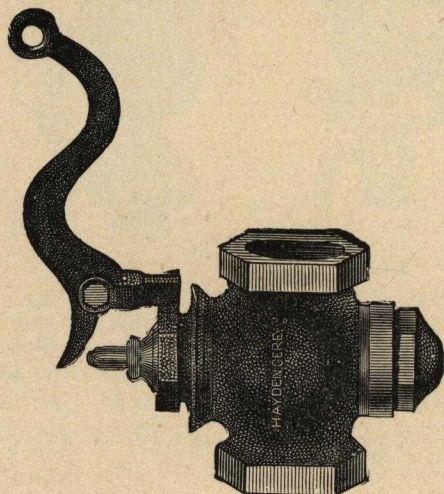
LONG BELL, ALL BRASS, STEAM WHISTLE.

WITHOUT VALVE.											
Diameter of Bell.....	1	1½	1½	2	2½	3	3½	4	5	6	8
Size for Iron Pipe.....	¾	1	1½	2	2½	3	3½	4	5	6	8
Each	\$1.70	2.00	2.50	3.25	4.50	6.00	8.50	11.00	18.00	24.00	65.00

WITH VALVE.											
Diameter of Bell.....	1	1½	1½	2	2½	3	3½	4	5	6	8
Size for Iron Pipe.....	¾	1	1½	2	2½	3	3½	4	5	6	8
Each	\$3.50	3.75	4.00	4.75	6.50	8.00	11.00	14.00	22.00	30.00	80.00

THREE WHISTLE CHIMES.

No. 1.	Composed of one each 1½, 2 and 2½ inch Whistles.....	22 00
No. 2.	Composed of one each 3½, 4 and 5 inch Whistles.....	\$ 40.00
No. 3.	Composed of one each 5, 6 and 18 inch Iron Base, Copper Bell Whistles.....	109.00

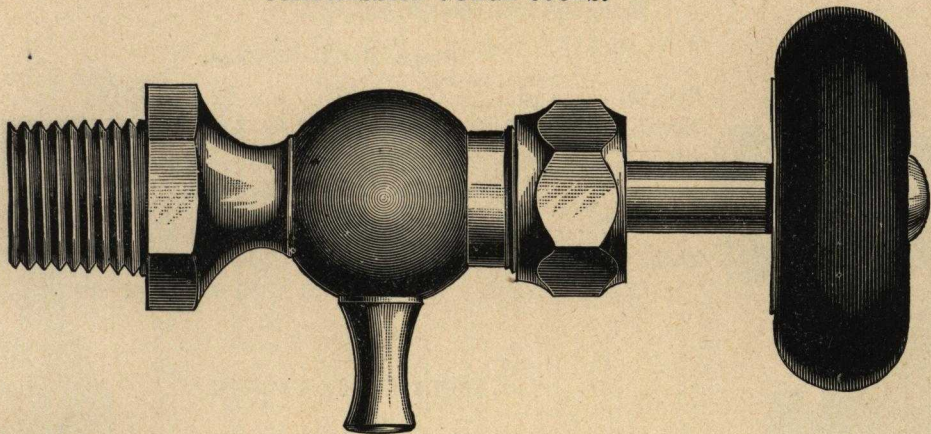


WHISTLE VALVE.

Steam Metal.

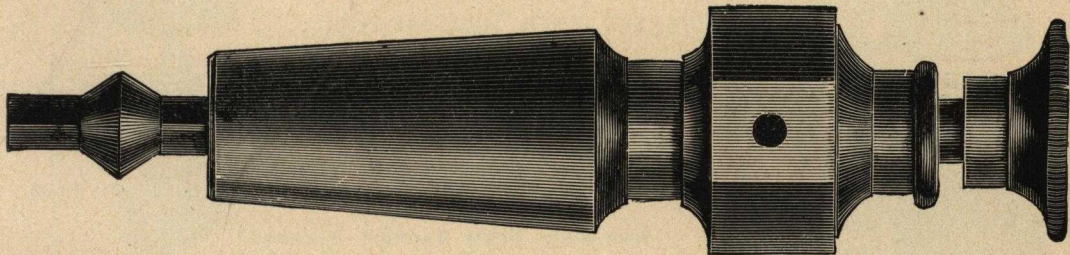
Size.....	½	¾	1	1½
Rough, each.....	\$2.25	2.75	3.25	4.00
Finished, each.....	3.00	3.50	4.25	5.25
Size.....	1½	2	2½	3
Rough, each.....	\$5.50	9.50	20.00	30.00
Finished, each.....	7.00	11.50	23.00	35.00

COMPRESSION GUAGE COCKS.



Size, inches.....	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Finished, each.....	\$ 0 95	1 00	1 10
With Stuffing Box, each.....	1 10	1 15	1 25

MISSISSIPPI GUAGE COCKS.

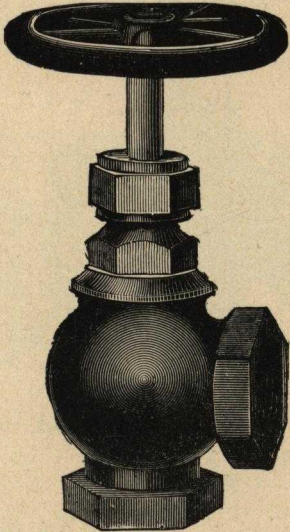
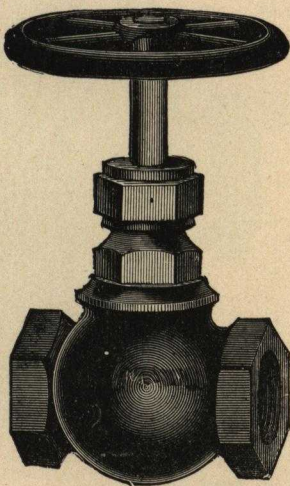


Diameter of Blank Shank	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{3}{8}$ in.
Cuts Iron Pipe to	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$	$\frac{3}{4}$	1 in.
Each,	\$ 0 60	0 75	1 00	1 25	1 50	2 00	2 50

These Guage Cocks will be furnished with blank shanks unless ordered threads.

GLOBE VALVES.

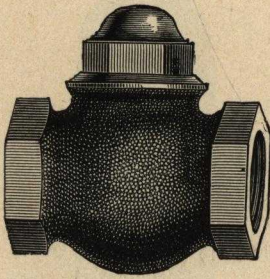
ANGLE VALVES.



PRICE LIST OF GLOBE AND ANGLE VALVES.
Best Steam Metal—Screwed.

Size,	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Globe and Angle Valves, each..	60	60	75	1 00	1 35	1 80	2 80	3 90	5 90	11 75	16 00
Cross Valves.....	85	85	1 00	1 50	2 00	2 50	3 50	5 00	8 00	16 00	24 00

HORIZONTAL CHECK VALVES.

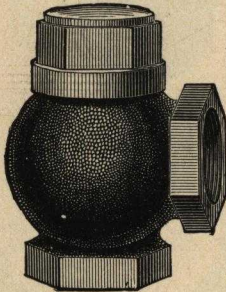


Steam Metal—Screwed.

Size, in.	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Each...	\$0 50	0 50	0 60	0 85	1 15	1 55	2 30	3 25	5 20	10 00	14 00

Iron Body, Brass Mounted.

Size.....	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	8
Each, Screwed..	\$6 25	9 75	12 75	15 00	24 00	33 00	65 00
“ Flanged..	8 25	12 75	16 25	19 00	28 00	38 00	71 00



ANGLE CHECK VALVES.

Steam Metal—Screwed.

Size, in.	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Each...	\$0 50	0 50	0 60	0 85	1 15	1 55	2 30	3 25	5 20	10 00	14 00



PERPENDICULAR CHECK VALVES.

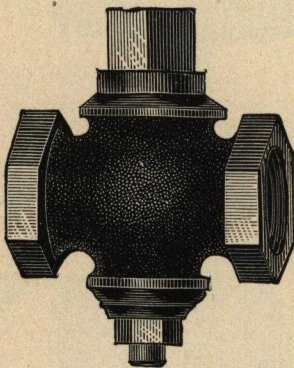
Steam Metal—Screwed.

Size, inches..	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Each.....	\$0 50	0 50	0 60	0 85	1 15	1 55	2 30	3 25	5 20	10 00	14 00

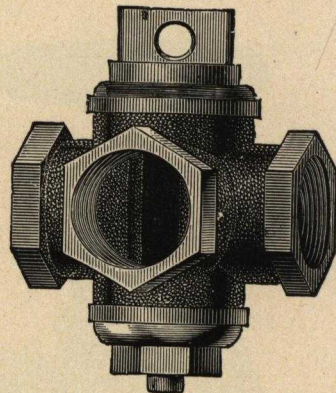
Iron Body, Brass Mounted—Screwed.

Size, inches.....	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	8
Each	\$6 25	9 75	12 75	15 00	24 00	33 00	65 00

STEAM COCKS.



THREE-WAY STEAM COCKS.



Steam Cock—Steam Metal, Flat or Square Head.

Size, inches....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Each	\$0 70	0 70	0 75	1 10	1 50	2 25	3 75	4 80	7 25	14 00	20 00	36 00	50 00

Three-Way Steam Cock—Square or Flat Head.

Size, inches.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Steam Metal.....each, \$1 65		2 25	3 40	5 50	7 00	10 00	18 00	26 00
Iron.....“	....	1 30	1 75	2 00	2 75	4 00	6 00	8 50
Iron, with Brass Plug....“	....	2 00	2 50	3 25	4 75	6 50	11 00	15 50

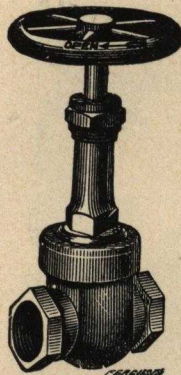
LUDLOW VALVES.

DOUBLE GATE BRASS VALVES.

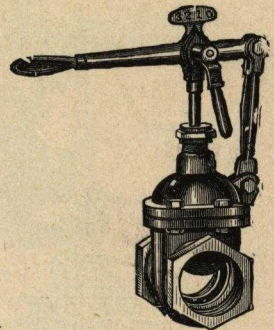
Screwed End.

Gland in Packing Box.

Quick Opening Valve
Slide Stem and Lever.



Size.	Screw Socket.	Flange.	Diam. of Stand. Flange.	Face to Face of Screw Socket.	Face to Face of Flanges.	*Extra.
In.			In.	In.	In.	
$\frac{1}{2}$	\$ 1 25	.....	.....	$2\frac{1}{4}$	.....	1 00
$\frac{3}{4}$	1 65	.....	.....	$2\frac{1}{2}$	.....	1 00
1	2 15	.....	.....	$2\frac{3}{4}$	.....	1 00
$1\frac{1}{4}$	3 15	.....	.....	3	.....	1 00
$1\frac{1}{2}$	4 25	.....	.....	$3\frac{1}{4}$	.....	1 00
2	6 25	\$ 11 50	6	$4\frac{1}{4}$	$4\frac{5}{8}$	1 00
$2\frac{1}{2}$	11 50	18 00	$6\frac{1}{2}$	$4\frac{3}{8}$	$5\frac{3}{8}$	1 25
3	16 00	22 00	7	5	$6\frac{1}{4}$	1 25
$3\frac{1}{2}$	21 00	31 00	$7\frac{1}{2}$	.....	.....	1 25
4	35 00	43 00	9	.....	$7\frac{1}{8}$	1 25
5	52 00	64 00	10	.....	.....	1 25
6	78 00	90 00	11	.....	9	1 25

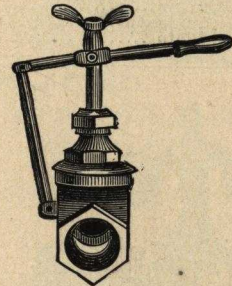


* Extra for Slide Stem and Lever, subject to discount.



LUNKENHEIMER GATE VALVES.

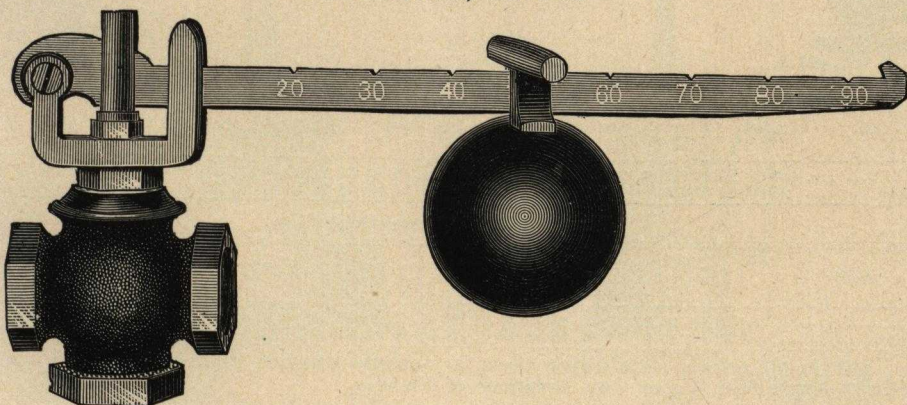
Best Composition Metal.



Size.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Screwed ends.....	\$1 00	1 00	1 20	1 75	2 50	3 50	5 00	7 50	15 00	22 00
Lever handle, quick op'g....	.....	.....	.....	.....	4 00	5 00	7 00	10 00	19 00	25 00

GLOBE SAFETY VALVES.

Steam Metal, Screwed.

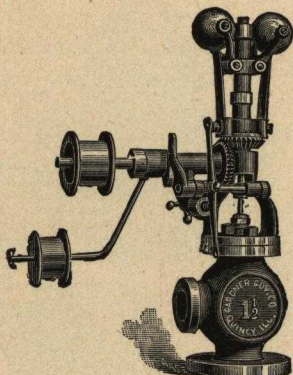


Size.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Screwed, each.....	\$2 00	2 00	2 25	2 75	3 50	5 00	7 00	8 50	12 00	20 00	30 00
Flanged, each.....	.....	.....	.....	.....	.....	9 50	13 50	17 50	25 00	34 00	50 00

Iron Body, Brass Mounted.

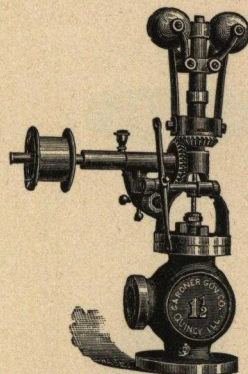
Size,	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	8 in.
Screwed, each	\$2 50	3 50	5 00	6 00	8 00	13 00	18 00	24 00	30 00	36 00	44 00	60 00	145 00
Flanged, each	3 50	5 00	6 75	8 25	10 50	16 00	22 50	29 25	36 00	42 00	50 00	67 50	154 00

GARDNER GOVERNORS.



CLASS A.

Spring Governor.

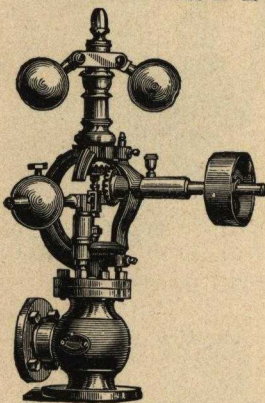


CLASS B.

Price List of Class "A" and "B" SPRING Governors.

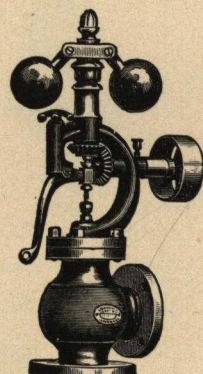
SIZE OF GOVERNOR. DIAMETER OF OPENING.	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$
Class B, Plain.....	\$16 00	18 00	20 00	22 00	25 00	30 00	35 00	40 00	45 00	50 00	60 00	71 00	83 00
Class B, Finished.....	18 00	20 00	22 00	25 00	29 00	34 00	40 00	45 00	51 00	58 00	69 00	81 00	94 00
Class A, Plain.....			23 00	25 50	29 50	36 00	42 00	48 00	53 00	59 00	71 00	83 00	96 00
Class A, Finished.....			25 00	28 50	33 50	40 00	47 00	53 00	59 00	67 00	80 00	93 00	107 00

Class B is without automatic stop and Class A with automatic stop.



CLASS A.

Compensation Governor.



CLASS B.

Class B—Without Automatic Stop.

SIZE.	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8
Plain.....	\$18 00	20 00	22 00	25 00	30 00	35 00	40 00	45 00	50 00	60 00	71 00	83 00	94 00	122 00	150 00	185 00
Finished.....	20 00	22 00	25 00	29 00	34 00	40 00	45 00	51 00	58 00	69 00	81 00	94 00	106 00	136 00	166 00	202 00

Class A—With Automatic Action.

SIZE.	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10
Plain.....	29 50	36 00	42 00	48 00	53 00	59 00	71 00	83 00	96 00	109 00	140 00	170 00	210 00	241 00	270 00
Finished.....	33 50	40 00	47 00	53 00	59 00	67 00	80 00	93 00	107 00	121 00	154 00	186 00	227 00	261 00	290 00

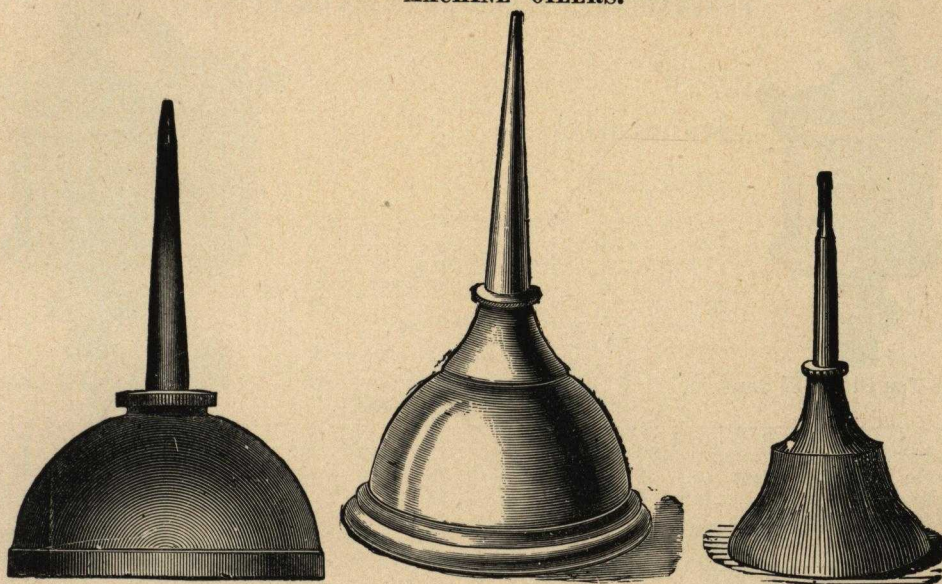
In all orders, state which Class is wanted—whether Plain or Finished, and with or without Angle Stop Valve, also Diameter of Flanges.

LIST AND DIMENSIONS OF ANGLE AND GLOBE VALVES.

Size—Inches.....	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8
Price, Flanged.....	\$9 75	11 50	12 50	18 00	22 00	25 00	32 00	38 00	50 00	80 00	103 00
Extra for Finished Hand Wheel.....	1 75	1 75	2 00	2 50	2 50	3 50	4 50	4 50	6 00	6 00	6 00
Diameter of Flanges—Inches.....	6	7	7	8	9	10	10	11	13	14	15

When Stop Valves are ordered with Governors, Angle Valves will in all cases be sent unless Globe Valves are specified.

MACHINE OILERS.



STAR OILERS.

These Oilers are made of fine sheet Steel, with wrought steel spouts.

No. 1, per dozen,	\$4 50
No. 2, "	\$5 50
No. 3,	\$6 50

SPUN ZINC OILERS.

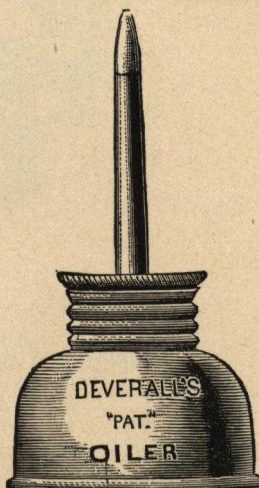
Spring Bottom,	Zinc,	Brass.
No. 0. per doz.	\$1 25	\$2 25
" 1, "	1 50	2 50
" 2, "	2 00	3 00
" 3, "	2 25	3 50
" 4, "	3 00	4 50
" 5, "	4 00	5 75
" 6, "	5 00	7 00

Malleable Iron Oilers.

With Pat. Elliptic Steel Spring.

No. 1, per dozen,	\$5 00
" 2, "	5 50
" 3, "	6 00

DEVERALL'S PATENT OILERS.



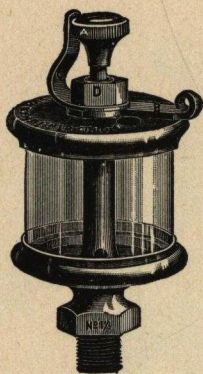
STEEL TIP BENCH OILER.



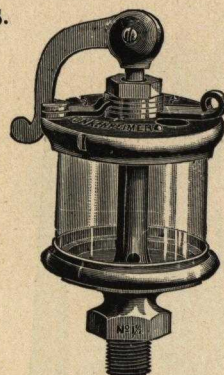
PERFECTION.

Steel Tip Bench Oiler.		Tin.	Tin Brass Bottom.	Brass.	Tin Brass Bottom Steel Tip.
No. 1.	Per Doz.	1 50	1 75	3 00	2 25
No. 2.	"	1 60	2 00	3 75	2 75
No. 3.	"	2 50	3 00	5 00	3 50
Perfection.		Tin Flaring.	Brass Flaring.	Brass Straight.	Copper Straight.
No. 1.	Per Doz.	2 90	3 75	11 00	10 00
No. 2.	"	3 25	4 25	13 75	12 50
No. 3.	"	3 75	4 75	15 75	13 50

LUNKENHEIMER IMPROVED GLASS OIL CUPS.



Slide Top Glass Oil Cups.



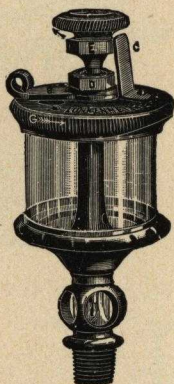
Index Glass Oil Cups.

PRICE LIST SLIDE TOP CUP.

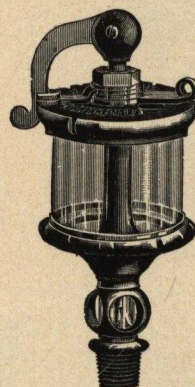
Number.....	000	00	0	1	1½	2	3	4	5	6
Outside Diam. of Glass.....in.	1	1½	1¾	1½	1¾	2	2½	2½	3	3½
Height of Glass.....in.	¾	1	1½	1¾	1¾	1¾	2½	2¾	3	4
Pipe Thread.....	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾
Finished Brass.....each	70	75	80	1 00	1 25	1 50	1 90	2 40	3 10	4 00
Nickel Plated.....each	80	85	95	1 20	1 50	1 75	2 20	2 75	3 50	4 50

INDEX CUP.

Number.....	0	1	1½	2	3	4	5	6
Outside Diameter of Glass.....in.	1¼	1½	1¾	2	2½	2½	3	3½
Pipe Thread.....	¾	¾	¾	¾	¾	¾	¾	¾
Finished Brass.....each	1 00	1 20	1 45	1 75	2 15	2 70	3 40	4 30
Nickel Plated.....each	1 15	1 40	1 70	2 00	2 45	3 05	3 80	4 80



Sight-Feed Glass Cups.



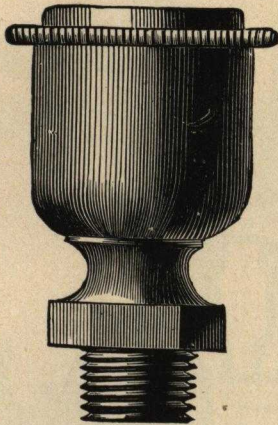
Index Sight-Feed Glass Cups.

PRICE LIST SIGHT-FEED GLASS CUPS.

Number.....	00	0	1	1½	2	3	4	5	6
Outside Diameter of Glass.....in.	1½	1¾	1½	1¾	2	2½	2½	3	3½
Pipe Thread.....	¾	¾	¾	¾	¾	¾	¾	¾	¾
Finished Brass.....each	1 10	1 25	1 50	1 75	2 10	2 55	3 15	3 90	4 80
Nickel Plated.....	1 20	1 40	1 70	2 00	2 35	2 85	3 50	4 30	5 30

INDEX CUP.

Number.....	0	0	1½	2	3	4	5	6
Outside Diameter of Glass.....in.	1¼	1½	1¾	2	2½	2½	3	3½
Pipe Thread.....	¾	¾	¾	¾	¾	¾	¾	¾
Finished Brass.....each	1 25	1 50	1 75	2 10	2 55	3 15	3 90	4 80
Nickel Plated.....	1 40	1 70	2 00	2 35	2 85	3 50	4 30	5 30



PLAIN OIL CUPS.

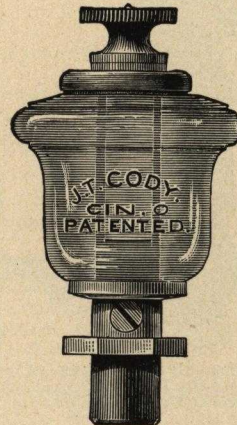
NEW LIST.

Diameter	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Diameter of Blank Shank,	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$
Cuts Iron Pipe, size.....	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$
Each.....	25	30	35	40	50	60	90

Diameter.....	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3
Diameter of Blank Shank	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Cuts Iron Pipe, Size . . .	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
Each.....	1.25	1.75	2.25	2.75	3.50	4.50



Automatic Shaft Cup.



Engine Cup.

CODY'S SHAFT AND ENGINE CUPS.

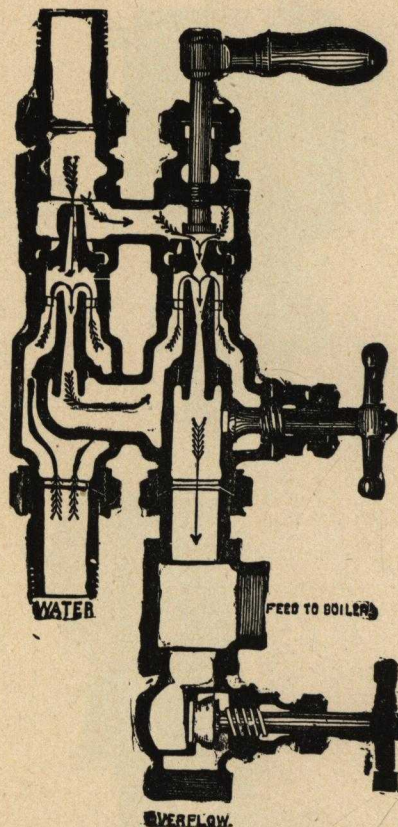
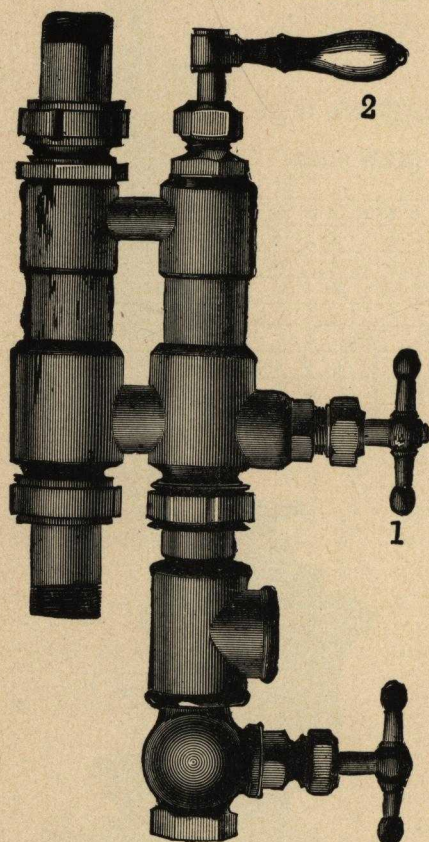
Number.....	1	2	3	7	8	9
Shaft, Cups per dozen.....	\$6 00	6 50	7 00	.....	.....	.....
Engine Cups, per dozen.....	.....	.....	.....	8 40	10 50	12 60

Shaft Cups are threaded $\frac{3}{8}$ -bolt Tap.

OILS.

Extra Lard Oil.....per gallon.....	\$.....
Cylinder Oil, by the barrel.....per gallon.....	0 45
Extra Engine Oil, by the barrel.....per gallon.....	0 30
Lubricating W. Va., by the barrel....per gallon.....	0 18

HANCOCK STATIONARY INSPIRATOR.

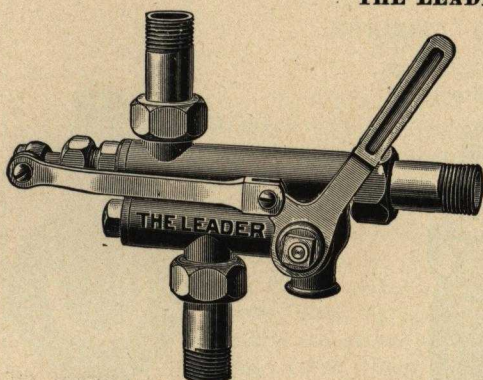


Place a globe valve in steam pipe just above the Inspirator for a starting valve, and a check valve in the feed-pipe between the Inspirator and the boiler. Blow out steam pipes before connecting. For a high lift or a long draught make the suction one size larger than the connections. Be sure that the suction connections are perfectly air tight. For a lift of 5 feet, about 15 lbs. steam pressure is required; for 10 feet lift, about 20 lbs. steam; for 15 feet, 25 lbs.; for 20 feet, 35 lbs.; for 25 feet, 45 lbs. Every machine is carefully tested before leaving the factory, and is warranted to work satisfactorily if the directions for connecting are strictly followed. To start the Inspirator, see that the overflow valves marked 1 and 3 are open, and the forcer valve marked 2 is closed. Give steam. After getting the water, close No. 1; open No. 2 one quarter of a turn, close No. 3, and the Inspirator is at work. No adjustment is necessary for varying steam pressure, but the quantity and temperature of the water delivered can be varied by increasing or reducing the steam or water supply. The conditions in different places vary so widely that we cannot give any absolute rule for operating.

PRICE LIST.

INSPIRATOR.	Size Connection.		Gallons per hour, 60 lbs. press.	Price.
	Suction and Feed Pipe.	Steam Pipe.		
No. 7 $\frac{1}{2}$	3	3	60	\$ 16 00
No. 8 $\frac{3}{4}$	3	3	85	18 00
No. 10.....	3	3	120	20 00
No. 12 $\frac{1}{2}$	3	3	220	25 00
No. 15.....	3	3	300	30 00
No. 17 $\frac{1}{2}$	1	3	420	40 00
No. 20.....	1	3	540	45 00
No. 22 $\frac{1}{2}$	1 $\frac{1}{4}$	1	720	55 00
No. 25.....	1 $\frac{1}{4}$	1	900	60 00
No. 30.....	1 $\frac{1}{2}$	1 $\frac{1}{4}$	1,260	75 00
No. 35.....	1 $\frac{1}{2}$	1 $\frac{1}{4}$	1,740	90 00
No. 40.....	2	1 $\frac{1}{2}$	2,230	110 00
No. 45.....	2	1 $\frac{1}{2}$	2,820	125 00
No. 50.....	2 $\frac{1}{2}$	2	3,480	150 00
No. 55.....	2 $\frac{1}{2}$	2	3,800	175 00

THE LEADER INJECTOR.



We place this perfected Boiler Feeder on the market, fully convinced that after years of experience with injectors, we now have all that the name implies, a "Leader" in every sense of the word. It is an improvement on the very best results obtained from several previous patents on injectors during past ten years.

DESCRIPTION.

"The Leader" has no movable parts in its internal construction, no loose valves, rings or springs to get out of order, and embodies simplicity, durability, neatness of design, great range of work under the various conditions required of injectors, high or low steam, long or short lift, without any adjustment or change of tubes, or Globe Valve in Suction Pipe.

OTHER ADVANTAGES.

- First.—Neat appearance on boiler; easy to connect.
- Second.—Heats water to about 200 degrees.
- Third.—Cannot freeze. Water runs back to well, or from leaky check valve not at overflow.
- Fourth.—Less liable to get out of order than a pump.
- Fifth.—Does away with Cross-Head Pump, which are only a source of noise and great side strain on the cross head of an engine.
- Sixth.—Will feed water through a heater.
- Seventh.—Can be started with a leaky check valve if necessary. See card in box for directions.
- Eighth.—Will inject crude petroleum into boiler to prevent formation of scale by leaving overflow slightly open, and connecting a short pipe to run from the overflow into the oil.

WHEN ORDERING AN INJECTOR PLEASE STATE.

- First.—The horse power of your boiler and engine.
- Second.—Give steam pressure carried.
- Third.—If water is taken under pressure or lift.
- Fourth.—If water is to be lifted give the lift or distance from the injector to the water supply, both vertically and horizontally.

DIRECTIONS FOR CONNECTING TO THE BOILER.

Take steam from the highest part of the boiler and connect to the coupling on top of the feeder, placing a globe valve on pipe at any point convenient to work it. Attach the feed pipe to the coupling on end of feeder; place a good check valve near to boiler as practical. It is desirable in laying suction pipe to make as few joints as possible, as the water line must be air-tight, otherwise the leader will not work; connect this to the coupling on bottom of feeder.

If the lift or draw from water supply is over fifteen feet distant the pipe should be one or two sizes larger than the connections on feeder.

Blow out steam pipe before attaching injector, to remove dirt or scale. If dirt or scale gets into steam lifting jet after Injector is connected, remove cap No. 2, and blow steam through, which will quickly remove the dirt.

HOW TO START.—Open globe valve on steam pipe full. When water appears at overflow pull lever back toward steam pipe, until it stops then Feeder is at work.

OPERATE UNDER PRESSURE.—In supplying the injector from a hydrant or tank pressure, place a globe valve in the water pipe to regulate the quantity of water delivered to the injector. When the water pressure is very great, this valve should be open very little to give satisfactory results.

Owing to unequal water pressure in cities it is best to take water from barrel or tank when possible.

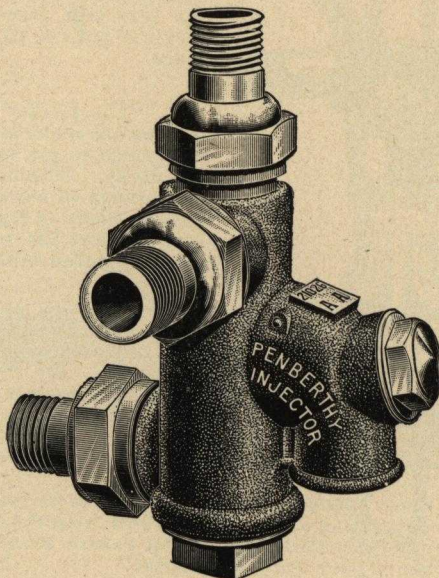
PRICE LIST.

EVERY INJECTOR TESTED AND FULLY GUARANTEED.

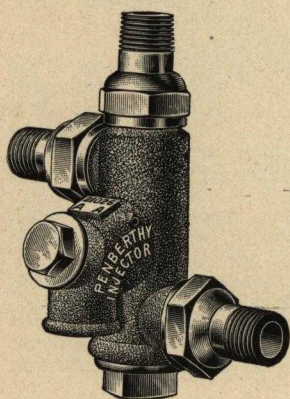
No. of Injector.	Size of Pipes.		Horse Power of Boiler, Will Feed.	Gals. per hour, 60 lbs. steam.	List Price
	Steam Pipe.	Suction & Feed.			
1	$\frac{3}{8}$	$\frac{3}{8}$	3 to 7	60	\$16 00
2	$\frac{1}{2}$	$\frac{1}{2}$	7 to 10	90	18 00
3	$\frac{1}{2}$	$\frac{1}{2}$	12 to 18	150	22 00
4	$\frac{3}{4}$	$\frac{3}{4}$	18 to 25	220	25 00
5	$\frac{3}{4}$	$\frac{3}{4}$	25 to 35	300	30 00
6	$\frac{3}{4}$	$\frac{3}{4}$	35 to 45	400	35 00
7	$\frac{3}{4}$	1	45 to 60	500	40 00
8	$\frac{3}{4}$	1	60 to 70	600	45 00
9	1	$1\frac{1}{4}$	70 to 90	750	55 00
10	1	$1\frac{1}{4}$	100 to 125	1000	65 00
11	$1\frac{1}{4}$	$1\frac{1}{4}$	125 to 150	1300	75 00
12	$1\frac{1}{4}$	$1\frac{1}{4}$	150 to 200	1800	90 00

THE PENBERTHY INJECTOR.

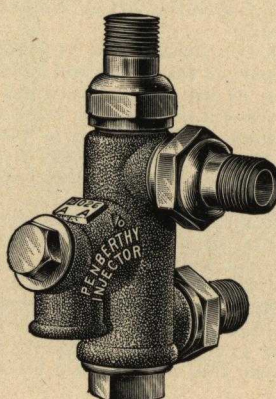
STYLE: LEFT AND BACK.
Regular Stock.



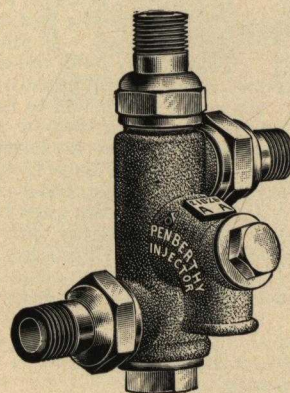
STYLE: LEFT AND RIGHT.



STYLE: RIGHT AND BACK.



STYLE: RIGHT AND LEFT.



Size.	Price.	Gallons per hour 65 lbs. pressure.	Size of Pipe Connection.	Horse Power.
No. 00.....	\$ 16 00	60	3/8	4 to 8
No. A.....	18 00	110	1/2	8 to 12
No. AA.....	20 00	150	5/8	12 to 16
No. B.....	25 00	220	3/4	16 to 28
No. BB.....	30 00	300	7/8	28 to 40
No. C.....	40 00	450	1	40 to 57
No. CC.....	45 00	540	1 1/4	57 to 72
No. D.....	55 00	700	1 1/2	72 to 93
No. DD.....	60 00	900	1 3/4	93 to 120
No. E.....	75 00	1,290	2	120 to 160
No. EE.....	90 00	1,740	2 1/2	160 to 220
No. F.....	110 00	2,270	3	220 to 290
No. FF.....	125 00	2,800	4	290 to 308

Capacity based on 65 pounds steam, 4 feet lift. A long lift decreases capacity in all Injectors.

STEAM JET PUMPS.

None Genuine Without Trade-Mark.



We claim to have the first successful and most powerful pump ever arranged on this principle, and it has advantages not elsewhere found.

Please notice that this pump is constructed to do all that can be done on this principle, and is attached to suction and discharge pipes by swivel of brass, and nipples of standard gas pipe sizes, so that, with the printed instructions sent with each pump, persons with ordinary skill can readily set and operate them.

Please notice, also, that these pumps are made, in all their parts, of standard sizes, and are uniform in their operation. We do not claim that this pump is adjustable, as it is well known that this feature in a pump is of no value. These pumps are made exclusively to pump water with a certainty, and our mode of proceeding is to shut off steam when sufficient water is obtained.

We make special pumps for special situations, and can make them to have 18 to 20 feet suction.

This pump being operated by steam direct from the boiler, can be placed in a well, cistern, near a river or other water supply, a long distance from the boiler. The standard size will make 14 feet suction, and raise water from 15 to 60 feet in height. The pressure of steam required is about one pound per square inch for each foot the water is to be raised.

To Purchasers of Pumps.

- 1.—Size of pump is determined by the internal diameter of suction pump.
- 2.—In no case should a smaller pipe be used than indicated in table below, and where the pump is placed a long distance from the boiler, the steam pipe should be one or two sizes larger, and protected by felting, or similar covering. This is also advisable where pumps are placed far under water, in wells, or are liable to be submerged by high water in rivers.
- 3.—With every pump we send a special guarantee.
- 4.—In ordering pumps give distance of water from tank; from the boiler to where the pump is desired to be placed; height to which the water is to be raised, and pressure of steam used.

Write plainly your address and express office

Exact duplicates of any parts of these pumps can be obtained of us. In ordering them, do not neglect to state the size of the pump.

Price of Pumps with Brass Fittings.

Size of Pump, Inch.	Suction Pipe, Inch.	Discharge Pipe, Inch.	Steam Pipe, Inch.	Steam Opening.	Capacity per Minute, Gallons.	PRICE.
$\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{16}$	8	\$ 8 00
1	1	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{8}$	15	10 00
$1\frac{1}{4}$	$1\frac{1}{4}$	1	$\frac{3}{4}$	$\frac{1}{4}$	20	12 00
$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{8}$	30	14 00
2	2	$1\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{4}$	40	16 00
$2\frac{1}{2}$	$2\frac{1}{2}$	2	1	$\frac{1}{2}$	50	20 00
3	3	$2\frac{1}{2}$	1	$\frac{3}{4}$	60	24 00

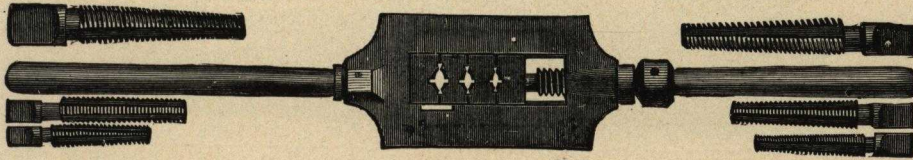
Brass pumps will be furnished at an additional cost of 15 to 20 per cent.

Parts of Blakeslee Jet Pump.

Size, inches.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Nuts	each, \$0 50	0 50	0 50	0 75	0 75	1 00	1 50	1 50
Malleable nipples.....	" 0 25	0 25	0 25	0 35	0 35	0 60	0 75	1 00
Combining pipes (loose tube) ..	.... 0 75	0 75	0 75	1 00	1 00	1 00	1 50	1 50
Steam tubes (tight tube)....	" 0 25	0 50	0 50	0 60	0 60	0 60	0 75	0 75

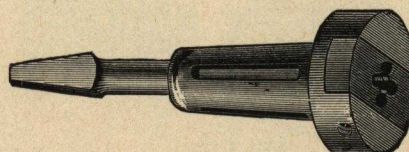
N. B.—Size of nipples determined by inside diameter. Size of nut determined by size nipple it will take.

BLACKSMITH'S STOCK AND DIES.



No. 6.	Cuts $1\frac{1}{2}$ to 1 in. Right hand, 8 threads to inch.....	8	Left	4 Taps and 2 Sets of dies.	\$ 20 00
„ 11	Cuts $1\frac{1}{2}$ to $\frac{3}{4}$ in. Right hand, 8 & 10 threads to the inch.....	8	Left	4 Taps and 3 Sets of dies.	10 00
„ 15.	Cuts $1\frac{1}{2}$ to $\frac{1}{2}$ in. Right hand, 8, 10, & 12 threads to inch.....	8	Left	5 Taps and 3 Sets of dies.	10 00
„ 21.	Cuts 1 to $\frac{1}{2}$ in. Right hand, 9 & 12 threads to inch.....	9	Left	4 Taps and 3 Sets of dies.	6 00
„ 23.	Cuts 1 to $\frac{3}{8}$ in. Right hand, 9, 10 & 14 threads to inch.....	9	Left	3 Taps and 3 Sets of dies.	5 00
„ 32.	Cuts $\frac{3}{4}$ to $\frac{3}{8}$ in. Right hand, 10 & 14 threads to inch.....	10	Left	4 Taps and 4 Sets of dies.	5 00
„ 33.	Cuts $\frac{3}{4}$ to $\frac{1}{2}$ in. Right hand, 10 threads to inch.....	10	Left	2 Taps and 2 Sets of dies.	4 00
„ 34.	Cuts $\frac{3}{4}$ to 5-16 in. Right hand, 10, 12 & 16 threads to inch.....	10	Left	3 Taps and 3 Sets of dies.	4 50
„ 35.	Cuts $\frac{3}{4}$ to $\frac{3}{8}$ Right hand, 10 & 14 threads to inch.....	10	Left	2 Taps and 2 sets of dies.	4 00
„ 37.	Cuts $\frac{3}{8}$ to 3-16 in. Right hand, 14, 18 & 22 threads to inch.....	14	Left	2 Taps and 2 Sets of dies.	4 00
„ 38.	Cuts $\frac{3}{8}$ to 5-16 in. Right hand, 12 & 18 threads to inch.....	12	Left	6 Taps and 3 Sets of dies.	4 50
„ 41.	$\frac{1}{2}$ to $\frac{1}{4}$ in. Right hand, 16, 20, & 26 threads to inch.....	16	Left	6 Taps and 3 Sets of dies.	3 25
„ 42.	Cuts $\frac{1}{2}$ to 3-16 in. Right hand, 14 & 20 threads to inch.....	14	Left	6 Taps and 3 Sets of dies.	3 25
„ 53.	Cuts 5-16 to 1-16 in. Right hand, 16, 20, 24 & 32 threads to inch.....	16	Left	4 Taps and 4 Sets of dies.	2 75

BIT, BRACE, COLLET AND DIE.



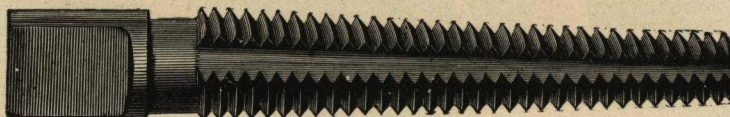
1 Collett, Tap and Die, 3-16 inch.....	\$ 1 90	1 Collett, Tap and Die, $\frac{3}{8}$ inch.....	\$2 00
1 " " $\frac{1}{4}$ ".....	1 90	1 " " 7-16 ".....	2 60
1 " " 5-16 ".....	1 95	1 " " $\frac{1}{2}$ ".....	2 70

TAPS.

PLUG.

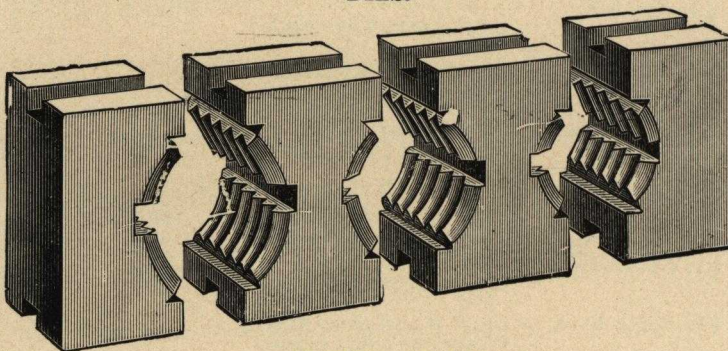


TAPER.

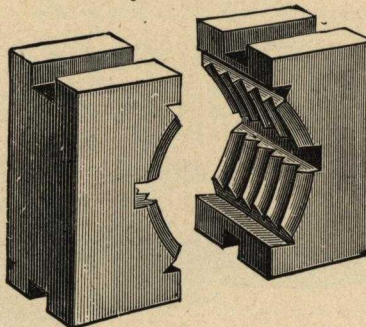


Size.	Hand.	Threads to the Inch.	Taps in Box.	Price each Tap.
1½	inch.	6, 7 and 8	2	\$ 3 00
1½	"	6, 7 and 8	2	3 00
1½	"	6, 7, 8 and 9	2	1 75
1½	"	8 and 9	2	1 75
1	"	7, 8, 9 and 10	2	1 25
1	"	8 and 9	2	1 25
¾	"	8, 9 and 10	4	90
¾	"	9	4	90
¾	"	7, 8, 9, 10, 12 and 14	4	65
¾	"	10 and 12	4	65
¾	"	10, 11, 12, 14 and 16	4	50
¾	"	10 and 12	4	50
9-16	"	10, 12, 14 and 16	4	50
9-16	"	12	4	50
½	"	10, 12, 14, 16 and 18	4	40
½	"	12 and 14	4	40
7-16	"	10, 12, 14, 16 and 18	6	40
7-16	"	14	6	40
5-16	"	12, 14, 16, 18 and 20	6	35
5-16	"	14, 16, 18, 20 and 22	6	30
3-16	"	16, 18, 20, 22, 24 and 26	6	30
¾	"	24, 26 and 28	6	30
		30 and 32	6	30

DIES.



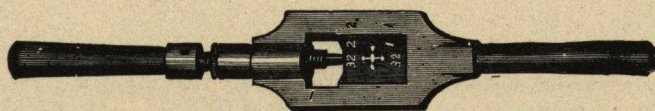
Complete set of Dies

Pair of Dies.
Prices.

Set of Dies.		
For No.	1 or 2 Stock	\$ 12 00
"	3 or 4	10 00
"	5 or 5½	8 00
"	6	6 00
"	7 or 9	3 50
"	11 or 15	3 00
"	17 or 19	2 50
"	21 or 23	2 00

Pair of Dies		
For No.	25, 27 or 32 Stock	\$2 25
"	33 Stock	1 50
"	34	2 00
"	35, 37, 38, 41 or 42 Stock	1 50
"	45 or 47 Stock	2 25
"	49 or 51	2 00
"	53	1 50

PATENT ADJUSTABLE TAP WRENCH.



- No. 0 Wrench, fitting Taps from $\frac{1}{16}$ to $\frac{1}{4}$, inclusive, entire length $5\frac{1}{2}$ in.....each, \$ 1 60
- A, fitting Taps from $\frac{1}{4}$ to $\frac{5}{8}$, and Reamers from $\frac{1}{4}$ to $1\frac{3}{8}$, inclusive, entire length 13 in....each, 3 00
- B, fitting Taps from $\frac{1}{2}$ to 1, and Reamers from $\frac{3}{8}$ to 1, inclusive, entire length 18 in....each, 4 00
- C, fitting Taps from $\frac{7}{8}$ to $1\frac{1}{2}$, and Reamers from $1\frac{1}{8}$ to $1\frac{1}{2}$, inclusive, entire length 23 in..each, 5 00
- D, fitting Taps from $1\frac{1}{4}$ to $2\frac{1}{8}$, and Reamers from $1\frac{1}{8}$ to $2\frac{1}{8}$, inclusive, entire length, $47\frac{1}{2}$ inches.....each, 15 00

MACHINISTS' HAND TAPS.

Patent Relieved V., U. S. or Whitworth Shaped Thread.



Taper.



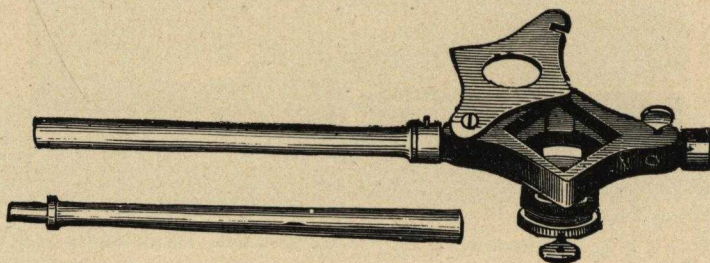
Plug.



Bottoming.

Size.	Whole Length.	Length Thread.	No. V Threads to Inch.	Price Each.	Price per Set of 3 Taps.
$\frac{1}{16}$	$2\frac{1}{8}$	$1\frac{1}{2}$	16, 18 and 20	\$ 45	\$1 35
$\frac{3}{32}$	$2\frac{7}{8}$	$1\frac{1}{4}$	16 and 18	50	1 50
$\frac{1}{8}$	$3\frac{1}{8}$	$1\frac{1}{4}$	14, 16 and 18	55	1 65
$\frac{7}{16}$	$3\frac{3}{8}$	$1\frac{3}{8}$	14 and 16	60	1 80
$\frac{1}{2}$	$4\frac{1}{8}$	$1\frac{3}{8}$	12, 13 and 14	70	2 10
$\frac{9}{16}$	$4\frac{3}{8}$	$1\frac{3}{8}$	12 and 14	80	2 40
$\frac{5}{8}$	$4\frac{3}{4}$	2	10, 11 and 12	90	2 70
$1\frac{1}{8}$	$5\frac{1}{8}$	$2\frac{1}{4}$	11 and 12	1 05	3 15
$1\frac{3}{8}$	$5\frac{3}{8}$	$2\frac{1}{4}$	10, 11 and 12	1 20	3 60
$1\frac{1}{2}$	$5\frac{1}{2}$	$2\frac{3}{8}$	10	1 40	4 20
$1\frac{3}{4}$	6	$2\frac{3}{8}$	9 and 10	1 60	4 80
$1\frac{7}{8}$	$6\frac{1}{8}$	$2\frac{3}{8}$	9	1 80	5 40
1.....	$6\frac{3}{8}$	$2\frac{3}{8}$	8	2 00	6 00
$1\frac{1}{8}$	$6\frac{5}{8}$	3	7 and 8	2 25	6 75
$1\frac{1}{4}$	$6\frac{7}{8}$	$3\frac{1}{4}$	7	2 60	7 80
$1\frac{3}{8}$	$7\frac{1}{8}$	$3\frac{1}{2}$	6	3 00	9 00
$1\frac{1}{2}$	$7\frac{3}{8}$	$3\frac{3}{4}$	6	3 50	10 50
$1\frac{3}{4}$	$8\frac{1}{8}$	$3\frac{1}{2}$	5 and $5\frac{1}{2}$	4 20	12 60
$1\frac{7}{8}$	$8\frac{1}{4}$	$4\frac{1}{8}$	5	5 00	15 00
$2\frac{1}{8}$	$9\frac{1}{8}$	$4\frac{1}{4}$	$4\frac{1}{2}$ and 5	5 80	17 40
2.....	$9\frac{3}{8}$	$4\frac{1}{2}$	$4\frac{1}{2}$	6 70	20 10

WALWORTH'S STOCKS AND DIES—FOR PIPE.



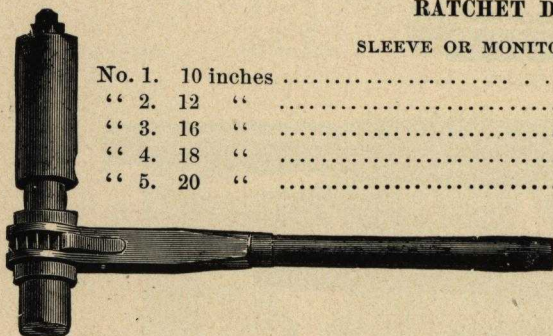
NUMBER.	0	1	1½	1¾	With Leader Screws.	
					2	3
Dies furnished with each plate.....	¼ to ½	¾ to 1	¾ to 1½	1 to 1½	1½ to 2	2½ & 3
Dimensions of Hill's Square Dies.....	2x½ in.	2½x¾ in.	3x¾ in.	3x¾ in.	4x¾ in.	5x1½ in.
Die Plates with R. H. Dies, complete	\$9.50	15.00	13.50	13.50	20.00	43.00
Die Plates without Dies	3.50	5.00	6.00	6.00	9.50	25.00
Extra Die, R. or L. Hand	1.50	2.00	2.50	2.50	3.50	9.00
Extra Bushings, each .....	.25	.35	.45	.45	.60	1.00
Die Frames, each.....	.....	.30	.40	.40	.50	.60

No. 3 Plate, with 4 handles, without Dies, \$33.00; with Dies, \$51.00.

RATCHET DRILLS.

SLEEVE OR MONITOR PATTERN.

No. 1.	10 inches	.....	each, \$10 50
“ 2.	12 “	.....	“ 13 50
“ 3.	16 “	.....	“ 16 00
“ 4.	18 “	.....	“ 19 00
“ 5.	20 “	.....	“ 23 00



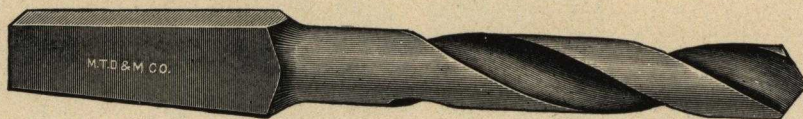
FLAT DRILLS.

FOR PACKER RATCHETS.



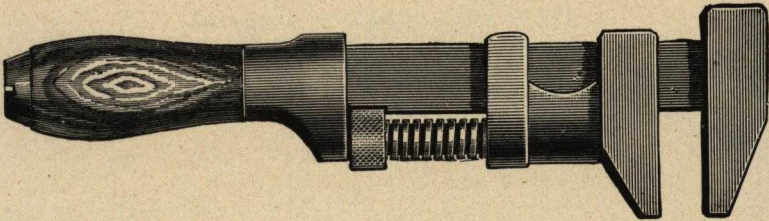
6 inches long.....	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Each.....	\$0.40	.40	.40	.45	.45	.45	.50	.55	.60	.65

TAPER SQUARE SHANK DRILLS FITTING RATCHETS.



With Shanks $\frac{5}{8}$ in. by $\frac{3}{8}$ in. and $1\frac{1}{2}$ in. long, and Shanks $\frac{3}{4}$ in. by $\frac{1}{2}$ in. and $1\frac{3}{4}$ in. long.

Diam....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{5}{8}$	$1\frac{1}{2}$	$\frac{3}{2}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{15}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$1\frac{1}{8}$	$\frac{3}{4}$	$1\frac{3}{8}$	$\frac{7}{8}$	$1\frac{15}{16}$	1	$1\frac{1}{8}$
Length..	5	5	5	5	6	$6\frac{1}{4}$	$6\frac{1}{2}$	$6\frac{3}{4}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{3}{4}$	$6\frac{1}{2}$	$6\frac{1}{2}$	7	$7\frac{1}{2}$	8	$8\frac{1}{2}$	9
Price....	\$1.00	1.05	1.10	1.15	1.20	1.25	1.25	1.30	1.30	1.35	1.40	1.45	1.55	1.75	2.05	2.30	2.55	3.10



WRENCHES.
COE'S GENUINE.
LIST PRICE.
BRIGHT.

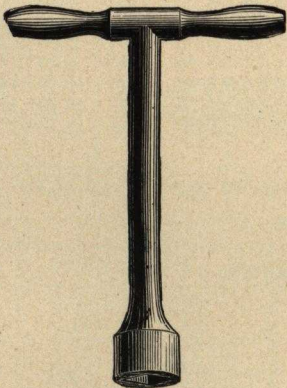
Inches.....	6	8	10	12	15	18	21
Price, each	\$0 85	0 95	1 10	1 35	2 20	2 70	3 20

BLACK.

Inches	6	8	10	12	15	18	21
Price, each.....	\$ 0 75	0 85	1 00	1 20	2 00	2 50	3 00

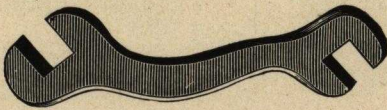
For the convenience of the trade we state the capacity or number of inches that each size wrench will open.

Size Wrench, in.....	4	6	8	10	12	15	18	21
Will open, in.....	$\frac{1}{2}$	$\frac{3}{4}$	1 $\frac{1}{4}$	1 $\frac{3}{4}$	2 $\frac{1}{8}$	2 $\frac{3}{8}$	3	4 $\frac{1}{8}$



"T" SOCKET WRENCH.

Price, - - - \$0 30.

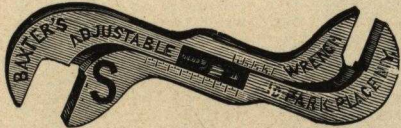


"S" WRENCH.

Price, - - - \$0 25.



IMPROVED



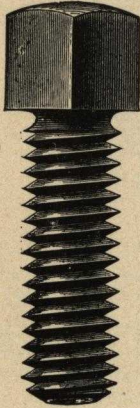
OLD PATTERN.

BAXTER'S ADJUSTABLE "S" WRENCHES.

Inches.....	4	6	8	10	12	15
Price, each.....	\$ 0 50	0 75	1 00	1 50	2 00	2 50

STEEL SET SCREWS,—Tempered.

PER HUNDRED.



Diameter of Screw.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Length under head to extreme point.												
$\frac{3}{8}$	2 50	2 75	3 10	3 60	4 25	5 30	6 25					
1	2 65	2 90	3 30	3 90	4 50	5 30	6 25	8 75				
$1\frac{1}{8}$	2 85	3 10	3 50	4 15	4 75	5 60	6 55	8 75	14 10			
$1\frac{1}{2}$	3 05	3 30	3 70	4 40	5 00	5 90	6 90	9 35	14 10	18 60		
$1\frac{3}{4}$	3 25	3 50	3 90	4 65	5 25	6 25	7 25	10 00	15 00	19 80	24 40	
2	3 50	3 75	4 15	4 95	5 55	6 60	7 60	10 75	16 10	21 25	26 35	31 60
$2\frac{1}{4}$	3 80	4 05	4 45	5 30	5 90	7 05	8 00	11 60	17 25	23 00	28 60	34 25
$2\frac{1}{2}$	4 10	4 45	4 80	5 75	6 35	7 55	8 50	12 50	18 50	24 70	30 85	37 00
$2\frac{3}{4}$	4 45	4 80	5 25	6 20	6 85	8 10	9 05	13 50	19 85	26 65	33 40	40 00
3	4 75	5 20	5 70	6 75	7 45	8 75	9 70	14 60	21 35	28 75	36 00	43 25
Threads to inch.	20	18	16	14	12	12	11	10	9	8	7	7

IRON SET SCREWS,—Case Hardened.

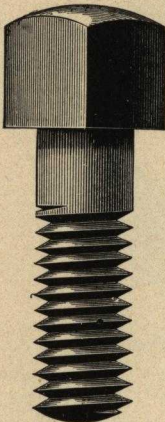
PER HUNDRED.



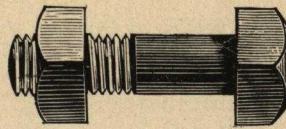
Diameter of Screw.	1-4	5-16	3-8	7-16	1-2	9-16	5-8	3-4	7-8	1
Length under Head to Point.										
$\frac{3}{8}$	2 00	2 20	2 50	2 90	3 40	4 25	5 00			
1	2 15	2 35	2 65	3 10	3 60	4 25	5 00	7 00		
$1\frac{1}{8}$	2 30	2 50	2 80	3 30	3 80	4 50	5 25	7 00	11 30	
$1\frac{1}{2}$	2 45	2 65	2 95	3 50	4 00	4 75	5 50	7 50	11 30	14 90
$1\frac{3}{4}$	2 60	2 80	3 10	3 70	4 20	5 00	5 75	8 00	12 00	15 90
2	2 80	3 00	3 30	3 95	4 45	5 30	6 05	8 60	12 90	17 00
$2\frac{1}{4}$		3 25	3 55	4 25	4 75	5 65	6 40	9 30	13 80	18 40
$2\frac{1}{2}$			3 85	4 60	5 10	6 05	6 80	10 00	14 80	19 80
$2\frac{3}{4}$				5 00	5 50	6 50	7 25	10 80	15 90	21 40
3					5 95	7 00	7 75	11 70	17 10	23 00
Threads to inch.	20	18	16	14	12	12	11	10	9	8

SQUARE HEAD CAP SCREWS.

PER HUNDRED.



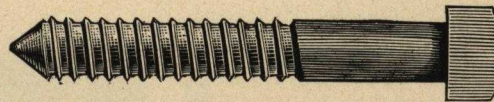
Diameter of Screw.	1-4	5-16	3-8	7-16	1-2	9-16	5-8	3-4	7-8	1
Length under Head to Point.										
$\frac{3}{8}$	2 40	2 75	3 20	3 80	4 40	5 75				
1	2 60	2 95	3 40	4 00	4 70	5 75	7 70			
$1\frac{1}{8}$	2 75	3 10	3 65	4 20	4 95	6 05	7 70	10 50		
$1\frac{1}{2}$	2 90	3 30	3 85	4 45	5 25	6 35	8 25	10 50	14 00	
$1\frac{3}{4}$	3 05	3 50	4 10	4 70	5 55	6 65	8 80	11 10	14 80	18 00
2	3 25	3 70	4 35	4 95	5 90	7 05	9 40	11 80	15 70	19 00
$2\frac{1}{4}$		4 00	4 65	5 25	6 30	7 55	10 10	12 60	16 70	20 20
$2\frac{1}{2}$			5 00	5 60	6 75	8 15	10 90	13 50	17 80	21 50
$2\frac{3}{4}$				6 00	7 25	8 85	11 80	14 60	19 10	23 10
3					7 80	9 65	12 80	15 90	20 60	25 00
Threads to inch.	20	18	16	14	12	12	11	10	9	8



MACHINE BOLTS,
WITH SQUARE HEADS AND NUTS, FINISHED POINTS.

PRICE PER HUNDRED.

Length.	$\frac{1}{4}$	5-16	$\frac{3}{8}$	7-16	$\frac{1}{2}$	$\frac{9}{16}$ & $\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
1 $\frac{1}{2}$	\$ 2 80	\$3 20	\$3 60	\$4 60	\$ 6 00	\$ 9 00	\$12 70	\$18 80	\$27 50
2	2 90	3 35	3 80	4 90	6 35	9 55	13 45	19 80	28 80
2 $\frac{1}{2}$	3 00	3 50	4 00	5 20	6 70	10 10	14 20	20 80	30 10
3	3 10	3 65	4 20	5 50	7 05	10 65	14 95	21 80	31 40
3 $\frac{1}{2}$	3 20	3 80	4 40	5 80	7 40	11 20	15 70	22 80	32 70
4	3 30	3 95	4 60	6 10	7 75	11 75	16 45	23 80	34 00
4 $\frac{1}{2}$	3 40	4 10	4 80	6 40	8 10	12 30	17 20	24 80	35 30
5	3 50	4 25	5 00	6 70	8 45	12 85	17 95	25 80	36 60
5 $\frac{1}{2}$	3 60	4 40	5 20	7 00	8 80	13 40	18 70	26 80	37 90
6	3 70	4 55	5 40	7 30	9 15	13 95	19 45	27 80	39 20
6 $\frac{1}{2}$	3 80	4 70	5 60	7 60	9 50	14 50	20 20	28 80	40 50
7	3 90	4 85	5 80	7 90	9 85	15 05	20 95	29 80	41 80
7 $\frac{1}{2}$	4 00	5 00	6 00	8 20	10 20	15 60	21 70	30 80	43 10
8	4 10	5 15	6 50	8 50	10 60	16 20	22 50	31 80	44 40
9			6 60	9 10	11 30	17 30	24 00	33 80	47 00
10			7 00	9 70	12 00	18 40	25 50	35 80	49 60
11			7 40	10 30	12 70	19 50	27 00	37 80	52 20
12			7 80	10 90	13 40	20 60	28 50	39 80	54 80
13					14 10	21 70	30 00	41 80	57 40
14					14 80	22 80	31 50	43 80	60 00
15					15 50	23 00	33 00	45 80	62 60
16					16 20	25 00	34 50	47 80	65 20
17					16 90	26 10	36 00	49 80	67 80
18					17 60	27 20	37 50	51 80	70 40
19					18 30	28 30	39 00	53 80	73 00
20					19 00	29 40	40 50	55 80	75 60



STANDARD LIST OF WOOD OR LAG SCREWS,—With Square Heads.

PRICE PER HUNDRED.

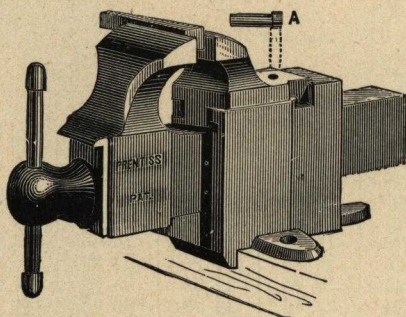
Length	5-16	$\frac{3}{8}$	7-16	$\frac{1}{2}$	$\frac{9}{16}$ & $\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
1 $\frac{1}{2}$	2 70	3 10	4 00	4 30				
2	2 90	3 30	4 25	4 65	6 50			
2 $\frac{1}{2}$	3 10	3 50	4 50	5 00	7 05	10 20		
3	3 30	3 70	4 75	5 35	7 60	10 95	16 00	
3 $\frac{1}{2}$	3 50	3 90	5 00	5 70	8 15	11 70	17 00	22 60
4	3 70	4 10	5 25	6 05	8 70	12 45	18 00	24 00
4 $\frac{1}{2}$	3 90	4 30	5 50	6 40	9 25	13 20	19 00	25 40
5	4 10	4 50	5 75	6 75	9 80	13 95	20 00	26 80
5 $\frac{1}{2}$	4 30	4 70	6 00	7 10	10 35	14 70	21 00	28 20
6	4 50	4 90	6 25	7 50	10 90	15 50	22 00	29 60
7			6 75	8 20	12 00	17 00	24 00	32 40
8			7 25	8 90	13 10	18 50	26 00	35 20
9			7 75	9 60	14 20	20 00	28 00	38 00
10				10 30	15 30	21 50	30 00	40 80
11				11 00	16 40	23 00	32 00	43 60
12				11 70	17 50	24 50	34 00	46 40

SKEIN SCREWS.

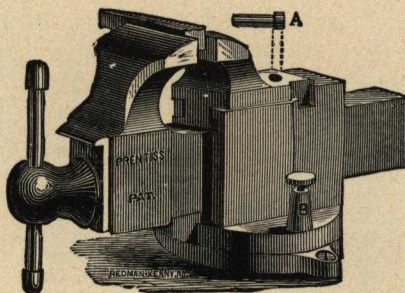
Skein Screws are sold by the hundred at the same price and discount as Lag Screws. They differ from the latter only in having threads not quite so deep and fewer to the inch.

PRENTISS' PATENT IRON WORKERS' VISES.

ADJUSTABLE JAW.



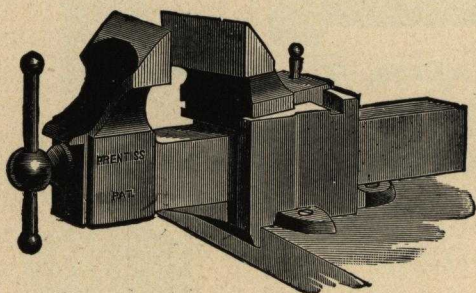
STATIONARY BOTTOM.



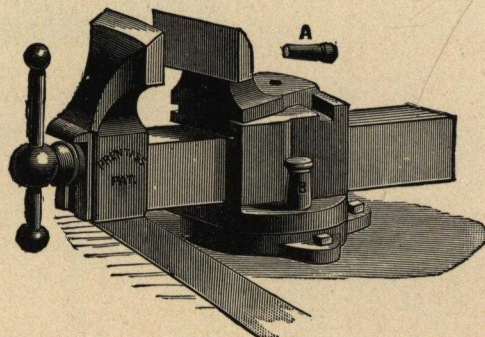
PATENT SWIVEL BOTTOM.

Width of Jaw.	Weight, Stationary Vise.	Weight, Swivel Vise.	Opens.	Stationary Vise, Each.	Swivel Vise, Each.
1 3/4 inch (Watchmakers')	2 lbs.	2 1/2 lbs.	1 1/4 in.	\$ 3 50	\$ 4 00
2 " (Jewelers')	3 1/2 "	4 1/2 "	2 "	4 00	5 00
2 3/4 " ("Amateurs")	13 1/2 "	17 "	3 1/2 "	5 50	6 75
3 1/2 " (Machinists')	28 "	32 "	4 3/4 "	7 00	8 50
4 1/2 " "	54 "	65 "	6 "	10 50	12 50
5 1/2 " "	96 "	109 "	8 "	17 00	19 00
6 " "	146 "	168 "	9 "	24 00	27 00
7 " "	184 "	207 "	11 "	30 00	35 00

PRENTISS' PATENT COACH MAKERS' OR WOOD-WORKERS' VISES.



STATIONARY BOTTOM.



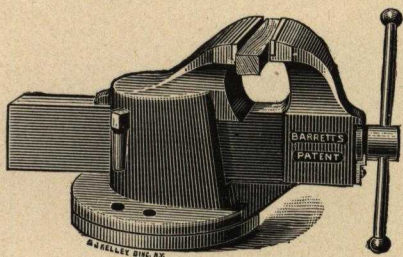
PATENT SWIVEL BOTTOM.

Width of Jaw.	Weight Stationary Bottom.	Weight Swivel Bottom.	Opens.	Price Stationary Bottom.	Price Swivel Bottom.
3 1/2 inches.....	30 lbs.	34 lbs.	7 inches.	\$ 8 00	\$ 9 50
4 1/2 "	59 "	67 "	9 1/2 "	11 00	13 00

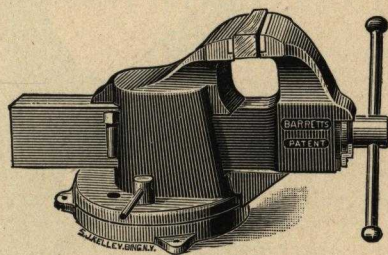
FINISHING OR FILERS' VISE.

Width of Jaw.	Weight Stationary Bottom.	Weight Swivel Bottom.	Opens.	Price Stationary Bottom.	Price Swivel Bottom.
4 inches.....	32 lbs.	36 lbs.	5 inches.	\$8 00	\$10 00

THE BARRETT PATENT ADJUSTABLE JAW VISE.



STATIONARY BOTTOM.

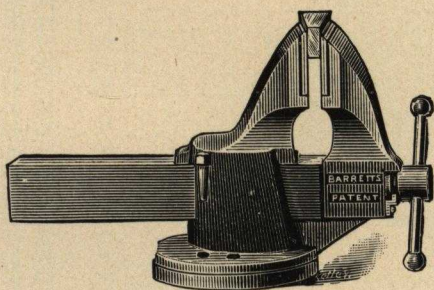


PATENT SWIVEL BOTTOM.

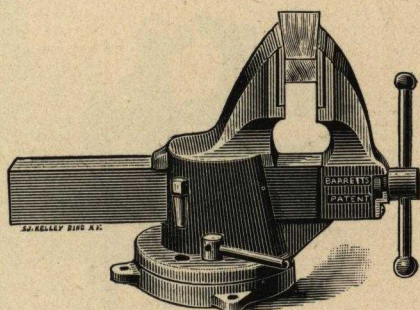
WIDTH OF JAW.	WEIGHT STATIONARY BOTTOM.	WEIGHT SWIVEL BOTTOM.	JAWS OPEN.	STATIONARY VISE, EACH.	SWIVEL VISE EACH.
3 in.	20 lbs.	24 lbs.	4 in.	\$ 6 25	\$ 7 75
3½ "	35 "	40 "	5 "	7 00	8 50
4 "	52 "	60 "	6 "	9 00	11 00
4½ "	65 "	70 "	7 "	10 50	12 50
5 "	94 "	105 "	8 "	15 50	17 75
5½ "	97 "	110 "	8½ "	17 00	19 00
6 "	150 "	165 "	9 "	24 00	27 00
6½ "	160 "	175 "	9½ "	27 00	30 00

BARRETT'S PATENT.

ADJUSTABLE JAW COACHMAKERS' VISE.

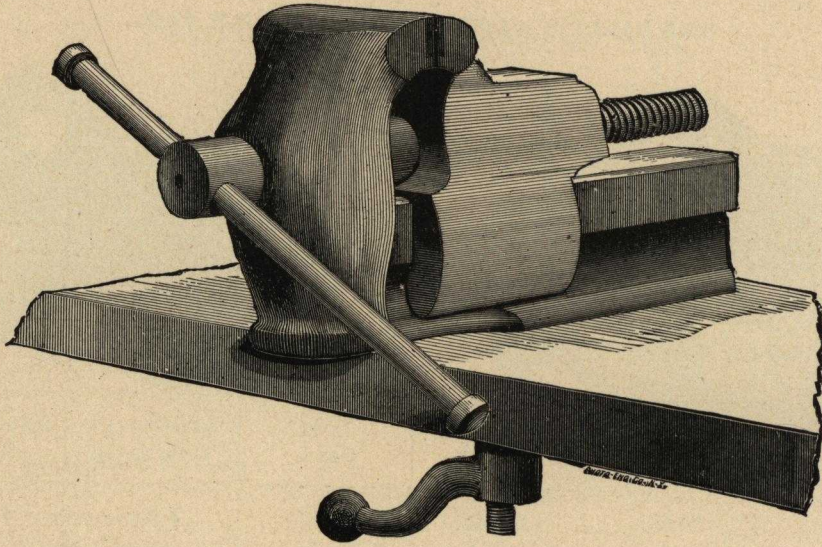


STATIONARY BOTTOM VISE.



PATENT SWIVEL BOTTOM VISE.

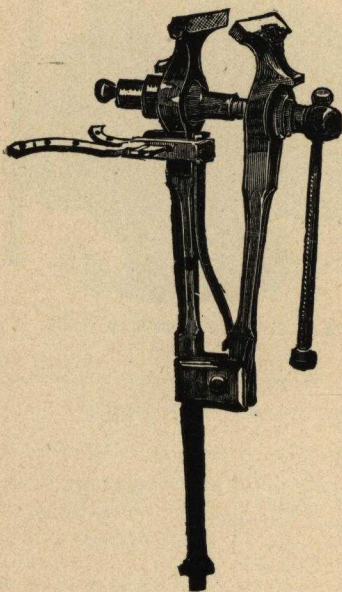
WIDTH OF JAW.	JAWS OPEN.	WEIGHT.	PRICE.
4½ in.	9½ in.	65 lbs.	\$11 00
4½ "	9½ "	70 "	13 00

**HEAVY CHILLED BEAM VISE.**

The jaws are steel-faced by welding, and massive strength and inertia are secured by a proper and plentiful use of metal. The motion is direct, and all surfaces exposed to sliding friction are chilled, thus gaining parallel action, durability and increased strength. Cheapness is secured by special machinery, which enables the vises to be quickly and economically made.

PRICE LIST.

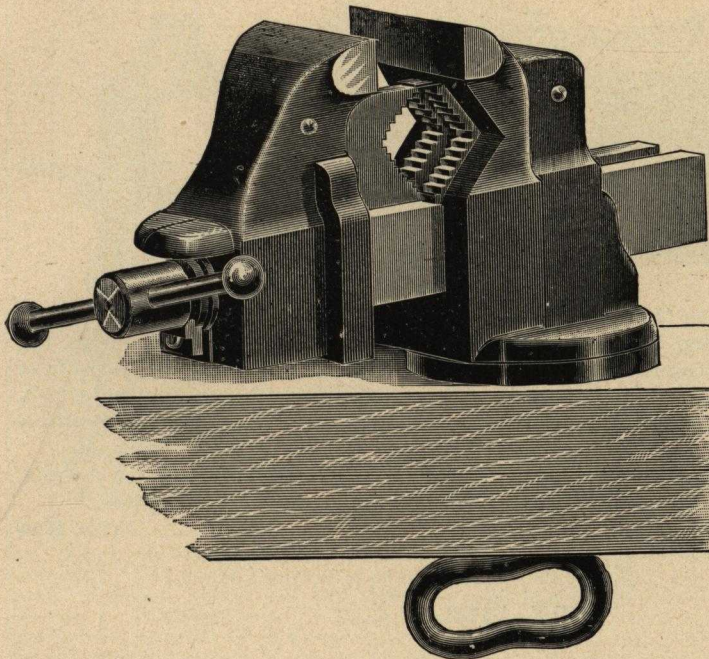
No. of Vise.	Diameter of Jaw.	Weight.	Price.
2	2 x inches.	15 pounds.	\$ 3 50
3	3 x "	30 "	6 00
4	4 x "	44 "	8 00
5	5 x 1 "	80 "	12 50
6	6 x 1 1/4 "	124 "	17 00

SOLID BOX VISES.

No. 35,	weighing about 35 pounds.....	each,	\$10 00
" 40,	" 40 "	"	10 50
" 45,	" 45 "	"	11 00
" 50,	" 50 "	"	11 50
" 55,	" 55 "	"	12 00
" 60,	" 60 "	"	13 00
" 65,	" 65 "	"	14 00
" 70,	" 70 "	"	15 00
" 75,	" 75 "	"	16 00
" 80,	" 80 "	"	17 50
" 85,	" 85 "	"	18 50
" 90,	" 90 "	"	20 00
" 95,	" 95 "	"	21 00
" 100,	" 100 "	"	22 00
" 105,	" 105 "	"	23 00
" 110,	" 110 "	"	24 00
" 115,	" 115 "	"	25 00
" 120,	" 120 "	"	26 00
" 125,	" 125 "	"	27 50
" 130,	" 130 "	"	29 00
" 135,	" 135 "	"	31 50
" 140,	" 140 "	"	33 00
" 145,	" 145 "	"	35 00
" 150,	" 150 "	"	36 00
" 160,	" 160 "	"	41 50
" 170,	" 170 "	"	44 50
" 180,	" 180 "	"	47 00
" 190,	" 190 "	"	53 00
" 200,	" 200 "	"	56 00

OUR PATENT STEEL BAR PIPE VISE.

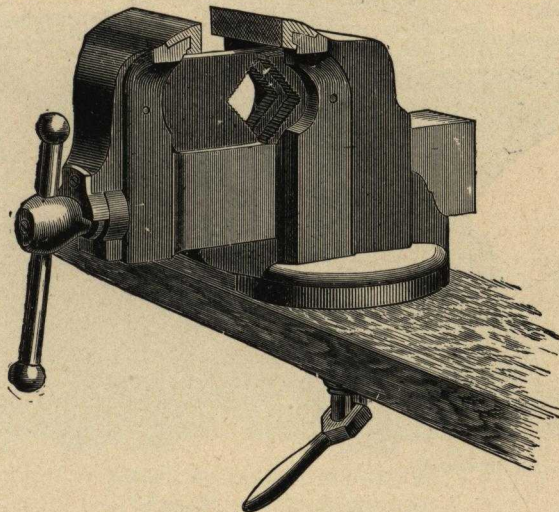
GUARANTEED NOT TO BREAK. THE HEAVIEST, STRONGEST AND BEST VISE ON THE MARKET.



We absolutely guarantee the Bars not to break; has all the good features of the old styles, and we are the only makers of this Vise; has malleable nut that can be replaced when worn out; wrought iron screw; steel-faced, file-cut jaws; cast by our improved process with iron, making steel and iron one continuous piece; steel jaws for holding pipe; best refined steel, case-hardened; in finish and looks the peer of any make. We will replace gratis any defects that should present themselves in this Vise.

No.	Holds Pipe.	Weight.	Price.	No.	Holds Pipe.	Weight.	Price.
1	$\frac{1}{8}$ to 2 inches	46 pounds	\$16 00	3	$\frac{1}{4}$ to 4 inches	94 pounds	\$28 00
2	$\frac{1}{4}$ to 3 inches	65 pounds	20 00	4	$\frac{3}{8}$ to 6 inches	156 pounds	35 90

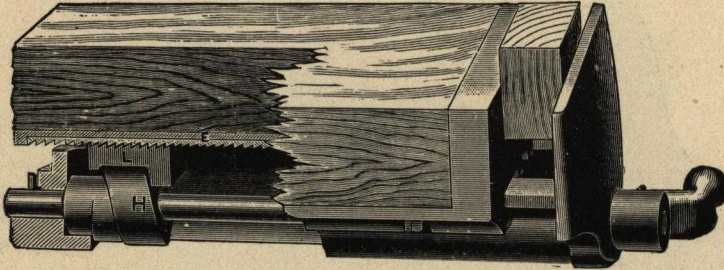
PARKER'S PATENT COMBINATION PIPE VISE.



No. 87.	Round and Pipers' Jaws,	43 pounds for holding 2 inch pipe and under	\$16 00
" 88.	" " " " 63 "	" 3 " " "	20 00
" 88 $\frac{1}{2}$.	" " " " 90 "	" 4 " " "	28 00
" 89.	" " " " 141 "	" 6 " " "	35 00

EXTRA PIPE JAWS FOR PARKER'S VISES.

Number.....	87	88	88 $\frac{1}{2}$	89
Per Set	\$3 50	4 00	5 00	6 00

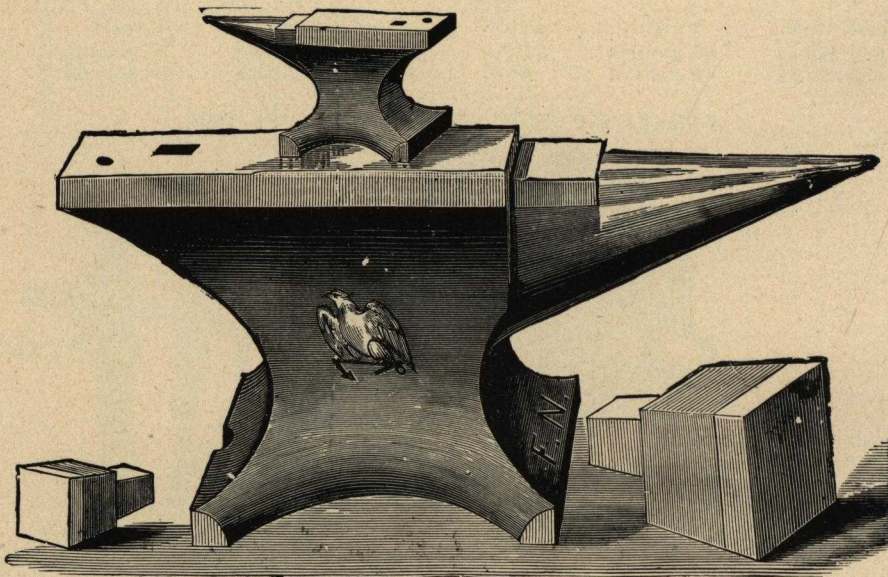
LIGHTNING GRIP WOOD - WORKERS' VISE.

Sectional views show dog (L) engaged with long rack (E), and the work firmly fastened between the jaws. By raising the handle to a vertical position, spiral cam (H) drops dog (L) out of engagement with long rack (E); the loose jaw is then at liberty to be moved in or out, and can be adjusted at once to any thickness of work within the scope of the vise, which, by a little more than a quarter turn of handle, is instantly fastened, all screwing being entirely dispensed with.

You can fasten in this vise three pieces of wood of 2, 6 and 12 inches wide in ten seconds.

No wood-worker should be without them. They will outwear four bench screws.

No. 17. 9 inch jaws — open 12 inches Price, \$6.00

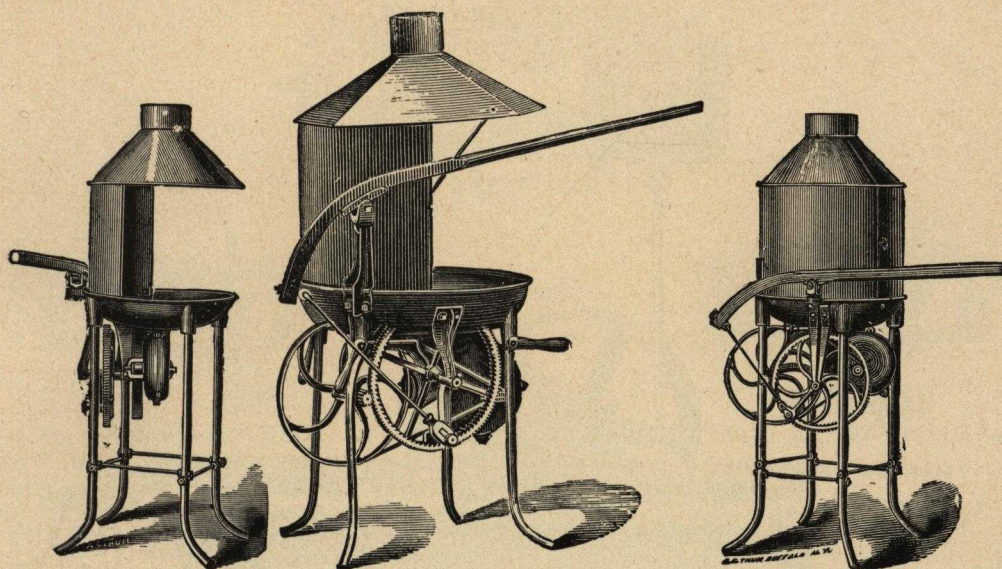
EAGLE ANVILS.

Anvils weighing 100 lbs. to 800 lbs.....10 cents per lb.

SMALLER ANVILS ("Minims.")

No.....	000	00	0	1	2	3	4	5	6	7	8	9
Weighing about	½ lb	4 lb	10 lb	15 lb	20 lb	30 lb	40 lb	50 lb	60 lb	70 lb	80 lb	90 lb
Each	\$1 00	1 75	2 25	2 75	3 00	3 75	4 25	5 00	5 50	6 00	7 00	8 00

No. 000 is Silver-plated.



FORGE No. 4.

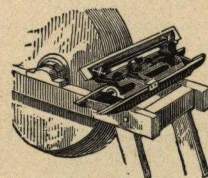
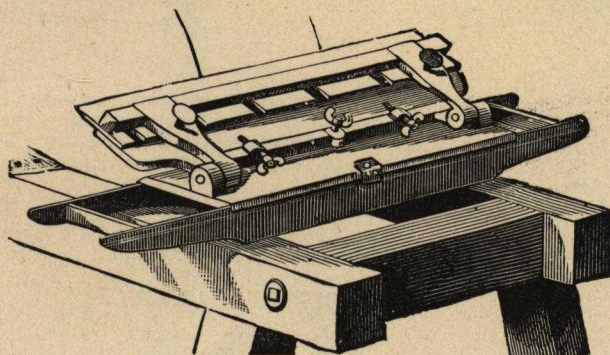
FORGE No. 1.

FORGE No. 6.

FORGES.

Among the many points of superiority of the Buffalo Forge over all others are strength, lightness, durability, workmanlike manner of construction, powerful blast, and ease with which same is operated. A glance at the cut will show the principle of their construction and the manner of operating. It is entirely new. There is no dead centre to overcome when starting up, and it is impossible to revolve the fan backwards. In operating it, one is not obliged to get down close to the fire and turn a crank in order to get his blast, but the movement of the lever (which requires but little power) in the Buffalo Forge, to drive the fan, is much like that of ordinary bellows, and being fixed on a swivel joint, has that easy motion which makes the work of operating it play instead of hard work.

	Size of Fan.	Size of Hearth	Height of Fireplace.	Weight.	Price.
No. 1, Half Open Hood.....	8 inch.	21x27 inch.	29 inch.	150 pounds,	\$40 00
No. 4, Half Open Hood.....	6 "	18 in. diam.	33 "	75 "	27 00
No. 6, Entirely Closed Hood.....	6 "	18 "	33 "	80 "	30 00



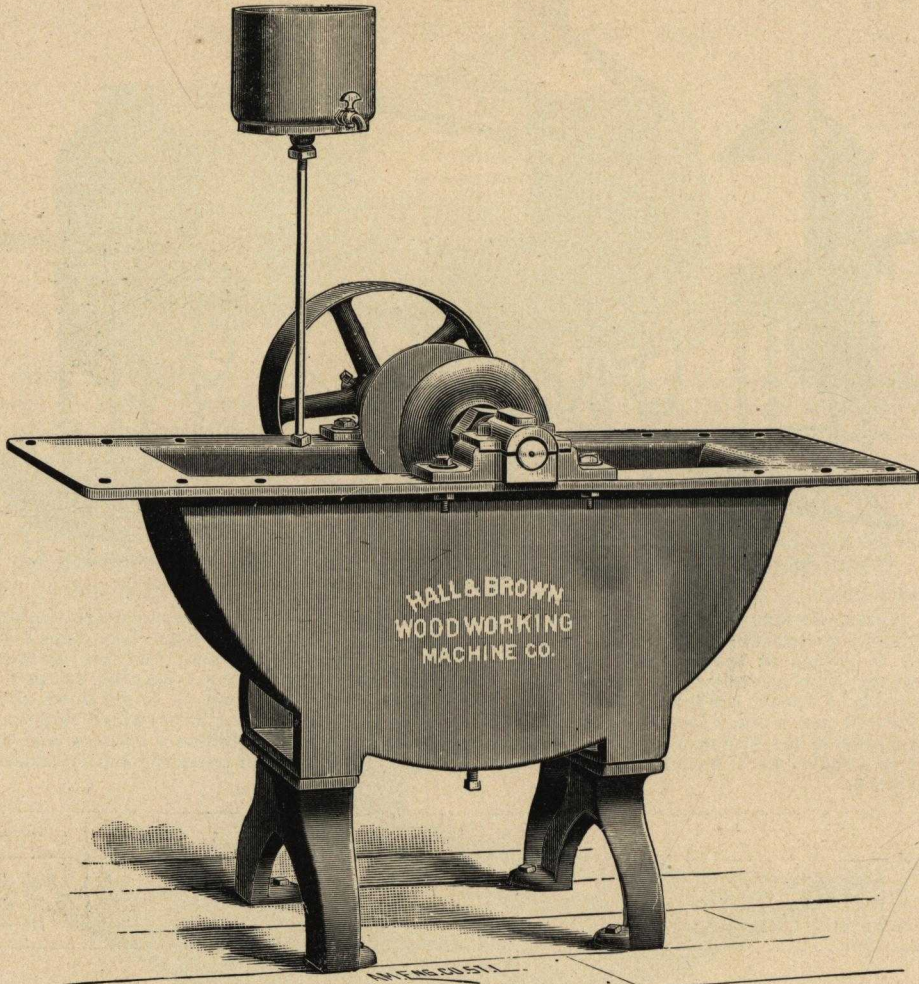
KNIFE GRINDING MACHINES.

WATER GRINDING MACHINE.

This Machine is constructed particularly for grinding Planer Knives and Matcher Cutters. It consists of a bed and sliding carriage. The bed can be placed upon any common grindstone frame. The knife is firmly clamped to the carriage, which is moved forth and back by hand, and can be elevated or depressed to grind any bevel desired.

By the use of this Machine, the knives are kept perfectly straight, and of course will do more perfect work than if ground by hand. The use of the Machine trues up and improves the condition of the grindstone.

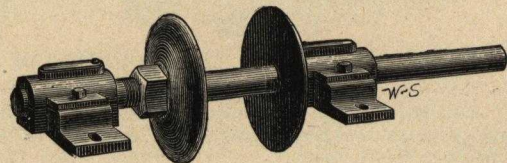
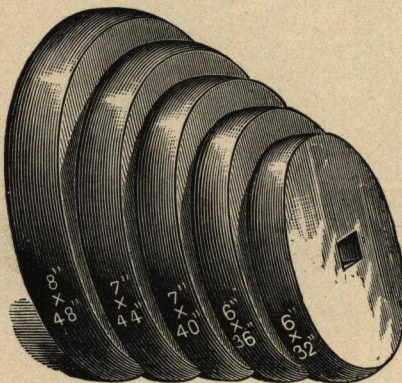
PRICE, . . . \$16 00

GRINDSTONE FRAME.

The above illustration represents our new Grindstone Frame, which we can recommend as a strong, substantial and cheap tool. The trough is cast in one piece, making it water tight, avoiding all joints which invariably work loose and leak. The legs are cast separate and are securely fastened in place with wrought iron bolts. We furnish the frame complete with arbor, driving pulley and water pot. Price complete, same as above, \$35.00.

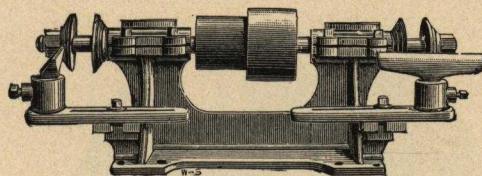
GRINDSTONES.

Prices quoted on application.

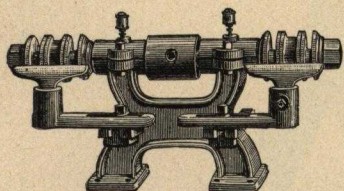
GRINDSTONE MANDREL.

Shaft, 2 inch diameter. One tight and one loose collar 10 in. diameter. Suitable for from 3 to 5 feet stone, 6 or 8 in. face. Price \$12.00.

We make them double when desired.

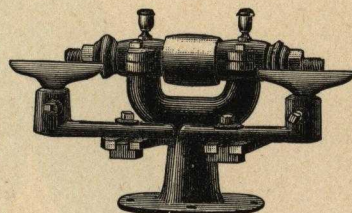


No. 3 EMERY GRINDER.



No. 2 EMERY GRINDER.

BENCH EMERY GRINDERS.



No. 1 EMERY GRINDER.

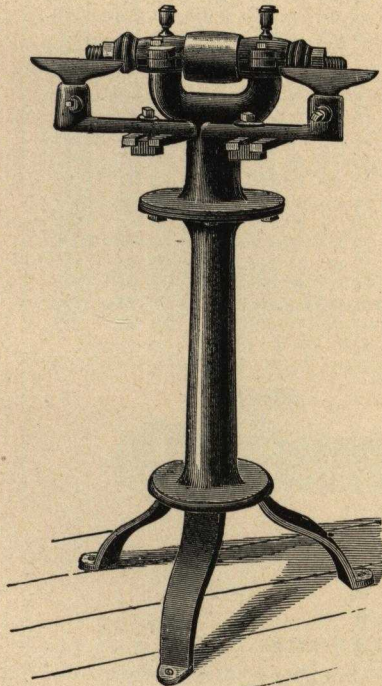
These Grinders are intended to be mounted on tables or benches. They are supplied with steel arbors running in boxes lined with the best Babbit metal.

No. 3 Machine has 1½ inch arbors and takes wheels up to 14 inch diameter, 2 inch face, is 23 inches between the wheels, has 4 and 6 inches diameter and 4 inch face pulleys; weight 160 pounds.

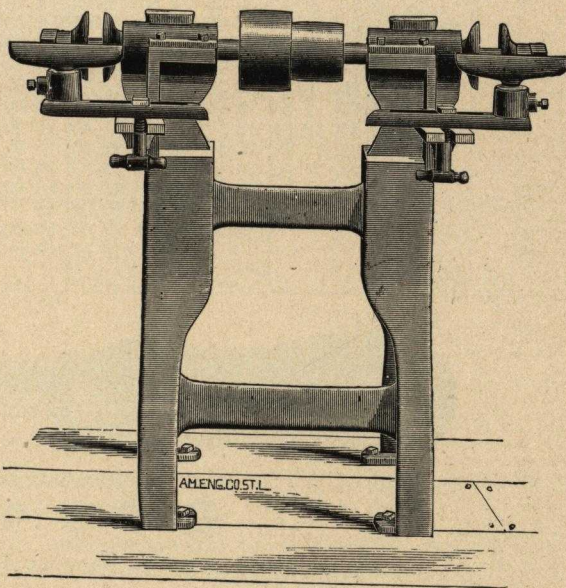
No. 2 Machine has 1 inch arbors, and takes wheels up to 10 inch diameter and 1 inch face. Four wheels can be used at the same time, is 12 inches between the two inside wheels, has pulley 3 inch diameter, 3½ inch face; weight, 60 pounds.

No. 1 Machine has 1 inch arbors, and takes wheels up to 10 inch diameter and 1 inch face. Two wheels can be used at the same time is 9½ inches between the wheels, has pulley 3 inch diameter, 3 inch face; weight, 40 pounds.

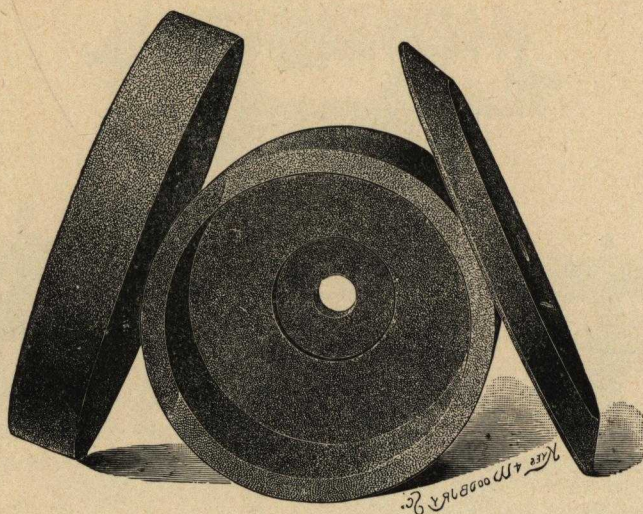
Price No. 3 Machine.....	\$30 00:	Counter-shaft.....	\$12 50
“ “ 2 “	20 00:	“	10 00
“ “ 1 “	15 00:	“	10 00


No. 1 EMERY GRINDER
with Iron Pedestal.

Price	\$24 00
Counter-shaft	10 00

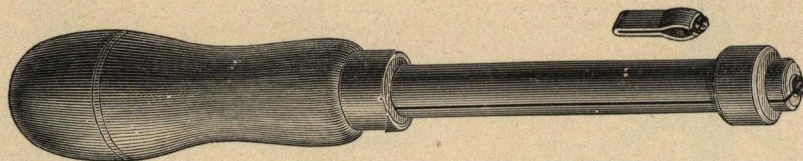

No. 3 EMERY GRINDER
with heavy Iron Frame.

Price	\$50 00
Counter-shaft	12 50



SOLID EMERY AND CORUNDUM WHEELS.

Diam. of Wheel in Inches.	THICKNESS IN INCHES.												Revolu- tions per minute.
	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	
$1\frac{1}{2}$	\$00.40	\$00.45	\$00.50	\$00.55	\$00.60	\$00.65	\$00.70	\$00.75	\$00.80	\$00.85	\$00.90	\$00.95	10000
2	50	55	60	65	70	75	80	85	90	95	1 00	1 05	10000
$2\frac{1}{2}$	65	75	85	95	1 05	1 15	1 25	1 35	1 45	1 55	1 65	1 75	8000
3	80	95	1 10	1 25	1 40	1 55	1 70	1 85	2 00	2 15	2 30	2 45	6000
$3\frac{1}{2}$	95	1 15	1 35	1 55	1 75	1 95	2 15	2 35	2 55	2 75	2 95	3 15	5000
4	1 10	1 35	1 60	1 85	2 10	2 35	2 60	2 85	3 10	3 35	3 60	3 85	4500
$4\frac{1}{2}$	1 25	1 55	1 85	2 15	2 45	2 75	3 05	3 35	3 65	3 95	4 25	4 55	4000
5	1 40	1 80	2 20	2 60	3 00	3 40	3 80	4 20	4 60	5 00	5 40	5 80	3700
6	1 75	2 40	3 05	3 70	4 35	5 00	5 65	6 25	6 80	7 45	8 10	8 75	3200
7	2 15	3 00	3 85	4 70	5 55	6 40	7 25	8 10	8 90	9 70	10 50	11 30	2700
8	2 60	3 60	4 60	5 60	6 60	7 60	8 60	9 60	10 60	11 60	12 60	13 60	2400
9	3 10	4 35	5 60	6 75	7 50	8 75	10 00	11 25	12 50	13 75	15 00	16 25	2100
$10\frac{1}{2}$	3 60	5 15	6 70	8 25	9 75	11 25	12 75	14 25	15 75	17 25	18 75	20 25	1800
12	4 25	5 75	7 35	9 00	10 70	12 25	14 00	15 70	17 40	19 00	20 70	22 25	1600
14	6 25	8 45	10 65	12 90	15 10	17 40	19 60	21 80	24 00	26 30	28 60	30 75	1350
16	8 00	10 85	13 70	16 50	19 40	22 25	25 00	27 90	30 75	33 50	36 40	39 25	1200
18	9 50	13 25	17 00	20 75	24 50	28 25	32 00	35 75	39 50	43 25	47 00	50 75	1050
20		16 00	20 50	25 00	29 00	33 50	38 00	42 50	47 00	51 50	56 00	60 50	950
24			29 00	36 00	43 00	50 00	57 00	64 00	71 00	78 00	85 00	92 00	850
30				50 00	61 00	72 00	83 00	94 00	105 00	116 00	127 00	138 00	700
36					95 00	110 50	126 00	141 50	157 00	172 00	188 00	204 00	550



Patented September 21st, 1875.



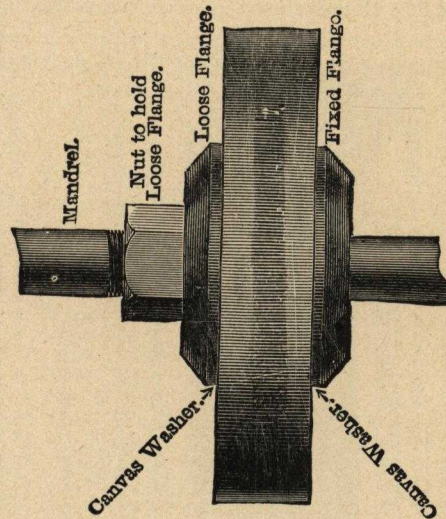
PRICE LIST OF PATENT DIAMOND TOOLS.

Above we illustrate the sizes of diamonds used in each number of turning tools.

No. 1, one Carat Diamond.....	Price, \$18 00	No. 4, $\frac{1}{4}$ Carat Diamond.....	Price, \$9 00
" 2, $\frac{3}{8}$ " " ".....	" 15 00	" 5, $\frac{1}{2}$ " " ".....	" 7 00
" 3, $\frac{1}{2}$ " " ".....	" 12 00	" 6, $\frac{3}{4}$ " " ".....	" 6 00

It is truly marvelous to contemplate the amount of work that a diamond one-half the size, of a grain of wheat will perform in turning Emery Wheels, Dressing Burr Mill Stones, &c. Our process is the only safe way of holding perfectly secure small diamonds, consequently we are able to supply parties using only one or two wheels with a diamond to suit their business and at a price to bring them within the reach of all.

We use the best Brazilian Diamonds, but cannot warrant them.



EMERY WHEELS.

CARE AND USE OF EMERY WHEELS—The higher the rate of speed at which any tool or machine is run, the greater the care necessary to keep it in order and secure the best results. The Emery Wheel is no exception to this rule. To run them on lathe centres and other extemporized traps is unwise and dangerous. It should be firmly mounted, run at a proper rate of speed, kept true by the use of a suitable tool; and the work, whatever it may be, should be held on a firm rest to steady it; should not be pressed against the wheel with great force nor allowed to rest in one position while being operated on, but should be kept in motion back and forth across the face of the wheel, this is important on all work and especially so in grinding saws and other tools. It prevents heating, tends to keep a good cutting surface, and allows the use of a harder and more durable wheel.

MOUNTING EMERY WHEELS.

The efficiency of an Emery Wheel is dependent upon the way it is mounted.

It should never go on the mandrel tight.

It should run perfectly true.

A fixed and loose flange should always be used with a canvas or rubber washer between the flanges and the wheel, as is shown in cut above.

The arbor should fit the boxes of the machines. The machines should be strong and well made, and stand firmly, and not vibrate or shake.



EMERY WHEEL DRESSER.

FOR TRUING, SHAPING, SHARPENING AND REMOVING GLAZE FROM SOLID EMERY WHEELS RUNNING AT FULL SPEED.

This tool is a simple and inexpensive device, designed to take the place of the expensive diamond tool, while it does the work in a more perfect and satisfactory manner, leaving the Emery Wheel sharp and in the best possible condition for cutting.

PRICES.

Patent Emery Wheel Dresser (two sets of cutters).....	\$3 00
Extra cutters, per set.....	50

REVISED LIST OF FILES AND RASPS.

Adopted by the File Manufacturers' Association of the United States.

Mill and Round.				Flat and Square.				Hand, Warding & Pillar.				Half Rd. & Three Sq.			
Inch.	Bastard.	2d Cut.	Smooth.	Inch.	Bastard.	2d Cut.	Smooth.	Inch.	Bastard.	2d Cut.	Smooth.	Inch.	Bastard.	2d Cut.	Smooth.
4	\$ 1 80	\$ 2 15	\$ 2 40	4	\$ 2 00	\$ 2 40	\$ 2 65	4	\$ 2 25	\$ 2 70	\$ 3 00	4	\$ 2 50	\$ 3 00	\$ 3 30
5	2 00	2 40	2 65	5	2 20	2 60	2 90	5	2 50	3 00	3 30	5	2 80	3 35	3 70
6	2 25	2 65	2 95	6	2 50	2 95	3 25	6	2 80	3 30	3 65	6	3 20	3 80	4 15
7	2 55	3 00	3 30	7	2 90	3 40	3 75	7	3 20	3 75	4 15	7	3 70	4 35	4 80
8	2 90	3 40	3 70	8	3 40	4 00	4 35	8	3 70	4 35	4 75	8	4 30	5 00	5 50
9	3 30	3 85	4 20	9	4 00	4 70	5 10	9	4 35	5 10	5 55	9	5 00	5 85	6 40
10	3 80	4 40	4 80	10	4 70	5 45	5 90	10	5 20	6 00	6 55	10	5 80	6 75	7 30
11	4 50	5 20	5 65	11	5 60	6 50	7 05	11	6 30	7 30	7 95	11	6 70	7 75	8 45
12	5 40	6 20	6 75	12	6 70	7 70	8 40	12	7 50	8 60	9 40	12	7 80	9 00	9 75
13	6 50	7 45	8 05	13	8 00	9 15	10 00	13	8 90	10 20	11 00	13	9 10	10 40	11 25
14	7 80	8 90	9 65	14	9 50	10 90	11 80	14	10 50	12 00	13 00	14	10 60	12 10	13 10
15	9 30	10 60	11 45	15	11 20	12 75	13 75	15	12 30	14 00	15 10	15	12 40	14 15	15 25
16	11 00	12 50	13 40	16	13 10	14 85	16 00	16	14 30	16 20	17 50	16	14 50	16 50	17 70
17	12 90	14 60	15 60	17	15 25	17 25	18 45	17	16 60	18 75	20 10	17	16 90	19 10	20 50
18	15 10	16 90	18 10	18	17 65	19 75	21 20	18	19 20	21 50	23 00	18	19 60	22 00	23 50
19	17 60	19 70	21 10	19	20 30	22 75	24 35	19	22 10	24 75	26 50	19	22 60	25 30	27 10
20	20 40	22 85	24 50	20	23 20	26 00	27 85	20	25 30	28 35	30 35	20	26 00	29 10	31 20

EXTRAS.		EXTRAS.		EXTRAS.		EXTRAS.	
Advance.		Advance.		Ginsaw (Single Cut)		Advance.	
Mill Double Cut, 1 in.		Cant Blunt,		take Bast. price.		Knife,	1 in.
Mill Narrow Pts. 1 "		(Double Cut) 2 in.		Slotting (Blunt),		High back $\frac{1}{2}$ rd.	
Cross Cut Saw,				Advance 2 in.		(Blunt) 2 "	
(Blunt) 2 "						Cross " 2 "	
						Feather Edge " 2 "	

Inch.	3	3½	4	4½	5	5½	6	7	8	9	10	11	12	13	14
Tapers, Single Cut.....	1 10	1 10	1 20	1 40	1 70	2 00	2 40	3 00	3 80	4 60	5 70	7 20	9 00	11 00	13 20
Tapers, Double Cut.....	1 60	1 60	1 75	2 00	2 40	2 75	3 25	4 00	4 95	5 90	7 10	8 80	10 80	12 90	15 20
Slim Tapers, Single Cut..	1 20	1 20	1 30	1 45	1 70	1 90	2 10	2 50	3 00	3 70	4 50	5 50	6 80	8 30	10 00
Slim Tapers, Double Cut..	1 80	1 80	1 90	2 10	2 40	2 60	2 85	3 30	3 90	4 70	5 60	6 75	8 20	9 75	11 50
Pitsaw Blunt, Single Cut..	2 10	2 10	2 20	2 30	2 50	2 80	3 20	3 70	4 30	5 00	5 80	6 70	7 70	.....	.....
Hooktooth, Single Cut....	.....	.....	.....	.....	.....	.....	3 60	3 90	4 40	5 10	6 00	7 10	8 40	.....	.....

Extras.	{	Bandsaw, Heavy Blunt, take Taper Double Cut Price.	} Taper Points same Price.
		Bandsaw, Light Blunt, take Slim Taper Double Cut Price.	
		Cantsaw, Blunt, Single Cut.	
		Round Gulleting, Blunt, Single Cut.	
		Round Off, Blunt, Single Cut, take Hooktooth price.	
		Tapers, pointed at both ends (without handles), double the price of Slim Tapers of one-half their length.	

Inch.	6	7	8	9	10	11	12	13	14	15	16	17	18
Horse { Plain .....	.....	.....	.....	.....	6 50	7 50	9 00	10 70	12 70	15 00	17 60	20 50	23 70
Rasps { Beveled & $\frac{3}{4}$ Rasps .....	.....	.....	.....	.....	7 20	8 30	10 00	11 80	14 00	16 50	19 40	22 50	26 00
Rasps { Tanged.....	.....	.....	.....	.....	9 00	10 25	12 00	14 00	16 50	19 50	23 00	.....	.....
Wood Rasps, $\frac{1}{2}$ Rd. & Flat.	4 20	5 00	6 10	7 30	8 75	10 40	12 30	14 50	16 90	19 60	22 50	.....	.....
Cabinet. { Rasps	6 00	7 00	8 20	9 60	11 20	13 00	15 00	17 20	19 60	22 20	25 00	.....	.....
Cabinet. { Files.....	4 20	5 00	6 10	7 30	8 75	10 40	12 30	14 50	16 90	19 60	22 50	.....	.....
Shoe { Half Round & Flat.	4 60	5 30	6 10	7 00	8 00	9 10	10 30	11 60	13 00	.....	.....	.....	.....
Rasps { Oval	5 30	6 10	7 00	8 00	9 10	10 30	11 60	.....	.....	.....	.....	.....	.....

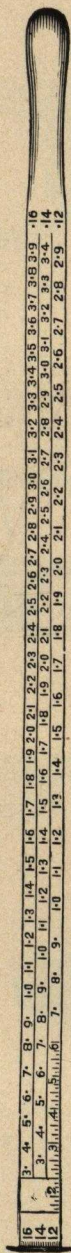
Extras. { File Rasps, Flat and Half Round, take Flat and Half Round Wood Rasp Price.
 { Wood Files, " " " " Bastard " "
 { Last Makers' Rasps, 1 inch advance on Cabinet Rasp Price.

EXTRAS. (GENERAL.)

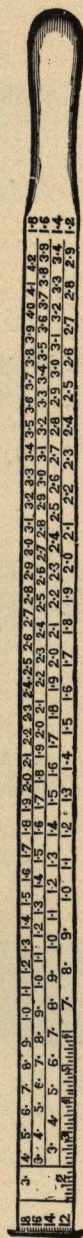
One Round Edge, Advance $7\frac{1}{2}$ per cent., and Two Round Edges, 15 per cent. on respective kinds and cuts.

Blunt Files, not specified, advance one inch on respective kinds and cuts. Dead Smooth double the price of Bastard Cut.

THREE TIER BOARD RULE.



Nos. 1, 2, 2N, 2½, 3, 5, 5½, 5, 6.
FOUR TIER BOARD RULE.

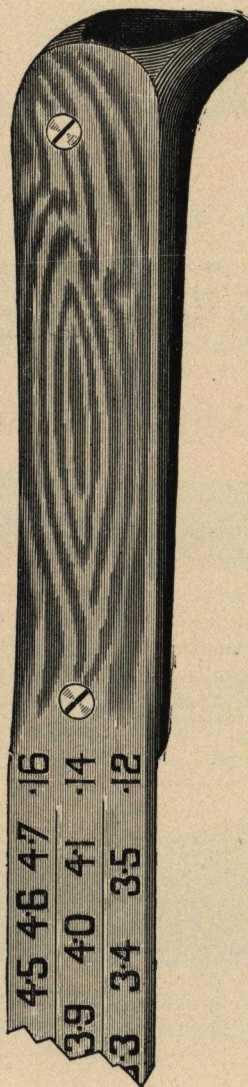


Nos. 7, 8, 11, 12.

No. 28., OCTAGON WALKING CANE BOARD RULE.



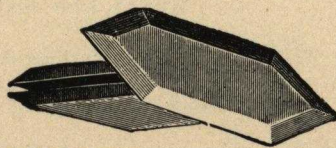
“ACME” INSPECTOR’S RULE, SHOWING HANDLE.



HICKORY BOARD RULES.

[illegible]

N. B. In ordering rules it is quite essential that, besides specifying list number, the length of lumber to be measured be given, as the requirements of different localities vary widely.

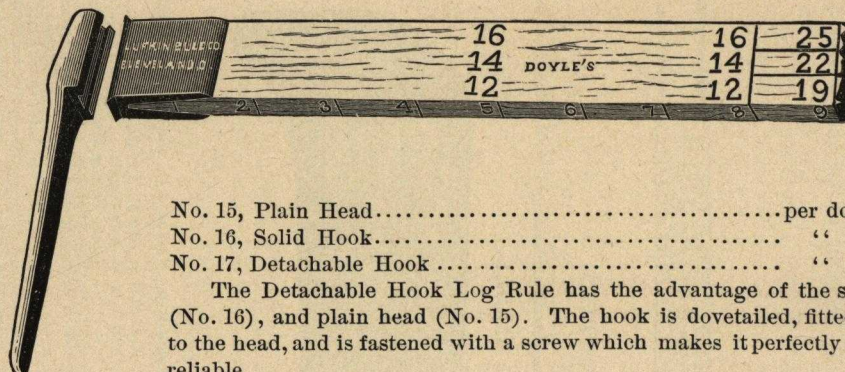


DIAMOND HEAD. [PATENTED.]

This patent Diamond Head for Board Rules is a favorite with many lumberman. In turning lumber with this head, the strain is brought on the edge of the rule. If so ordered, it can be applied to rules of the following numbers on the above list, viz: Nos. 1, 2, 2N, 2½, 3, 6, 6N, 8, 10, 12 and 13. Extra per doz. \$2 00 net.

HICKORY LOG RULES.

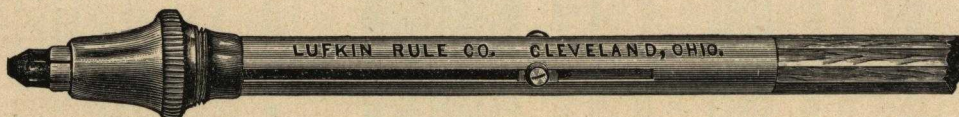
FIGURED 48 IN., WITH 8 IN. HANDLE. FULL LENGTH, 4 FT. 8 IN. ANY SCALE.



No. 15, Plain Head.....	per doz.	\$25 00
No. 16, Solid Hook.....	“	27 00
No. 17, Detachable Hook.....	“	28 00

The Detachable Hook Log Rule has the advantage of the solid head (No. 16), and plain head (No. 15). The hook is dovetailed, fitted exactly to the head, and is fastened with a screw which makes it perfectly solid and reliable.

IMPROVED MARKING STICK.



This article has proved a great convenience to the Lumber Inspector. It is adapted to the regular leads in general use, and grips them firmly. It allows of the entire consumption of the lead, proving a great economizer. It has a handle made in regular board rule style, giving the user a good, firm hand hold. Nicely finished and nickle-plated.

Inspector's Stick, 36 inches long, with Hickory Handle.....	per doz.	\$12 00
Pencil Holder only, without Handle.....	“	10 00

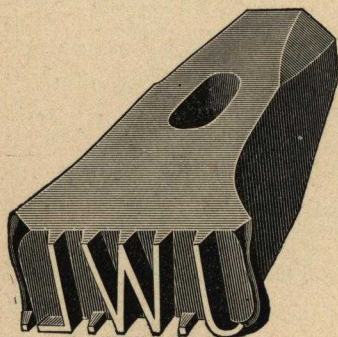
LUMBER LEADS.



Dixon's Lumber Leads are specially adapted to our "Marking Sticks."

We carry in stock all the different colors, which will be furnished at the lowest prices.

No. 361, Black.....	per gross,	\$ 9 00
No. 521, Blue.....	“	12 00
No. 520, Red.....	“	12 00



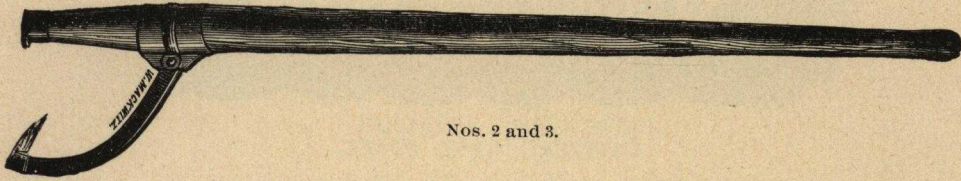
STEEL LOG MARKING HAMMER.

For Marking the ends of Logs.

$\frac{3}{4}$ in. Letters or Figures.....	each,	\$ 75
1 in. “ “	“	1 00
$1\frac{1}{4}$ in. “ “	“	1 25
$1\frac{1}{2}$ in. “ “	“	1 50

Add 50c. per pound for Steel Forgings.

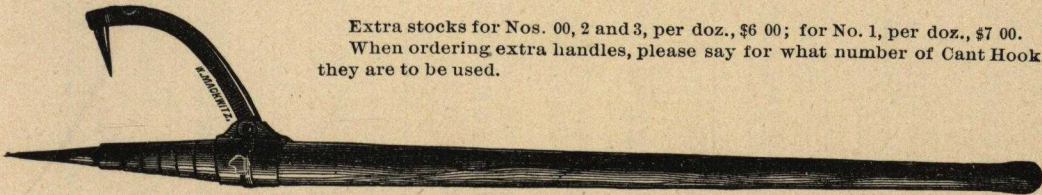
CANT HOOKS AND PIKE POLES.



Nos. 2 and 3.

		Stock.	Length of Handle.	Size of Hook.	Diam. of Handle.	Price, per Doz.
No. 00	For small logs, telegraph poles, bridge timbers, etc.....	Hickory.	4 feet.	1½ l'g x ¾ base.	2½ inch.	\$20 00
" 1	For river driving, with pike ¾ inch square.....	Maple.	5½ and 6 feet.	2½ " x ¾ "	2½ "	31 00
" 2	For light mill use.....	Hickory.	4½ feet.	2½ " x ¾ "	2½ "	22 00
" 3	For large logs.....	Maple or Hickory.	5 and 5½ feet.	2½ " x ¾ "	2½ "	25 00

Extra stocks for Nos. 00, 2 and 3, per doz., \$6 00; for No. 1, per doz., \$7 00.
When ordering extra handles, please say for what number of Cant Hook they are to be used.



No. 1,

HAND SPIKES.



Maple or hickory stocks. Spike ¾ inch square.

5 feet long.....per doz., \$16 00 | 5½ feet long.....per doz., \$17 00 | 6 feet long.....\$18 00

PIKE POLES.

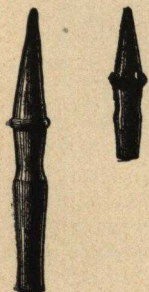
For River Driving.

White Ash Poles.



	Per doz.		Per doz.
10 feet long, with pike and rings.....	\$14 00	10 ft. long, with pike, hook and rings, complete..	\$16 00
12 " " " " "	15 00	12 " " " " " " " ..	17 00
14 " " " " "	16 00	14 " " " " " " " ..	18 00
16 " " " " "	18 00	16 " " " " " " " ..	20 00
18 " " " " "	22 00	18 " " " " " " " ..	24 00

Pikes and rings, only, \$9 00 per doz. Pikes, hooks and rings, only, \$10 50 per doz.



BOOT CALKS.

For Rafters.

Beaded Ball Calks, small.....	per 1,000, \$ 8 00
" " " medium.....	" 9 00
" " " large.....	" 10 00
" Heel "	" 12 00



CRUCIBLE CAST STEEL.

Transmission and Standing Ropes—Seven Wires to the Strand.

Trade No.	Diameter in Inches.	Circumference in Inches.	Circumference of Hemp Rope of equal strength.	Weight per foot in lbs. of Rope with Hemp Centre.	Breaking Strain in tons of 2,000 pounds.	Proper Working Load in tons of 2,000 pounds.	Price per foot in Cents.
11	1½	4½	15	3.37	67	16	70
12	1⅝	4¼	13	2.77	55	12½	60
13	1¾	3¾	12	2.28	45	10	50
14	1⅞	3⅝	10½	1.82	36	8	40
15	1	3	10	1.50	30	6½	32
16	7⁄8	2⅝	8½	1.12	22	5	25
17	¾	2⅜	7½	0.88	17	3½	19
18	11-16	2¼	6½	0.70	13½	3	16
19	¾	1⅞	5½	0.57	10	2½	14
20	9-16	1⅞	5	0.41	8	1¾	11
21	½	1⅝	4½	0.31	6	1¼	9
23	¾	1⅞	3½	0.19	4	1	6
24	5-16	1	3¼	0.16	3	¾	5

NOTE.—The prices given are for Hemp Centre Ropes. When made with Wire Centre the price per foot is 10 per cent. extra. The weight of Wire Centre Rope is 10 per cent. more than that of Ropes with Hemp Centres.

IRON.*

Transmission and Standing Rope—Seven Wires to the Strand.

Trade No.	Diameter in Inches.	Circumference in Inches.	Circumference of Hemp Rope of equal strength.	Weight per foot in lbs. of Rope with Hemp Centre.	Breaking Strain in tons of 2,000 pounds iron.*	Proper Working Load in tons of 2,000 pounds.	Price per foot in Cents.
11	1½	4½	10½	3.37	36	9	57
12	1⅝	4¼	10	2.77	30	7½	48
13	1¾	3¾	9½	2.28	25	6½	41
14	1⅞	3⅝	8	1.82	20	5	33
15	1	3	7	1.50	16	4	27
16	7⁄8	2⅝	6½	1.12	12.3	3	21
17	¾	2⅜	5½	0.88	8.8	2½	16
18	11-16	2¼	5	0.70	7.6	2	14
19	¾	1⅞	4½	0.57	5.8	1½	12
20	9-16	1⅞	4	0.40	4.1	1	9
21	½	1⅝	3½	0.31	2.83	¾	7½
22	7-16	1¼	2½	0.23	2.13	½	6½
23	¾	1⅞	2½	0.19	1.65		5½
24	5-16	1	2¼	0.16	1.38		4½
25	9-32	7⁄8	2	0.13	1.03		3½

* Bessemer or Siemens Martin Rope at the same price as Iron Rope. Their breakage strain is about one-fourth greater.



CRUCIBLE CAST STEEL.

Hoisting Rope—Nineteen Wires to the Strand.

Trade No.	Diameter in inches.	Circumference in inches.	Circumference of Hemp Rope of equal strength.	Weight per foot in lbs. of Rope with Hemp Cen.	Breaking strain in tons of 2,000 pounds.	Proper working load in tons of 2,000 lbs.	Min. size of drum or sheave in feet.	Price, per foot, in cents.
1	2 $\frac{1}{4}$	6 $\frac{3}{4}$		8.00	130	26	9	152
2	2	6		6.30	100	21	8	120
3	1 $\frac{3}{4}$	5 $\frac{1}{2}$	15 $\frac{3}{4}$	5.25	78	17	7 $\frac{1}{2}$	100
4	1 $\frac{1}{2}$	5	14 $\frac{1}{2}$	4.10	64	13	6	80
5	1 $\frac{1}{8}$	4 $\frac{3}{8}$	13 $\frac{1}{2}$	3.65	55	11	5 $\frac{1}{2}$	71
5 $\frac{1}{2}$	1 $\frac{3}{8}$	4 $\frac{3}{8}$	12 $\frac{1}{2}$	3.00	46	9	5 $\frac{1}{4}$	60
6	1 $\frac{1}{4}$	4	11 $\frac{1}{2}$	2.50	39	8	5	50
7	1 $\frac{1}{8}$	3 $\frac{1}{2}$	10	2.00	30	6	4 $\frac{1}{2}$	41
8	1	3 $\frac{1}{4}$	9 $\frac{1}{4}$	1.58	24	5	4	34
9	$\frac{7}{8}$	2 $\frac{3}{4}$	8	1.20	20	4	3 $\frac{3}{4}$	27
10	$\frac{3}{4}$	2 $\frac{1}{4}$	6 $\frac{1}{2}$	0.88	13	3	3 $\frac{1}{2}$	21
10 $\frac{1}{2}$	$\frac{5}{8}$	2	5 $\frac{1}{4}$	0.70	9.0	2	3	17
10 $\frac{3}{4}$	9-16	1 $\frac{5}{8}$	4 $\frac{3}{4}$	0.44	6.5	1	2 $\frac{3}{4}$	15
10 $\frac{7}{8}$	$\frac{1}{2}$	1 $\frac{1}{2}$	4 $\frac{1}{2}$	0.35	5.5	1	2	13

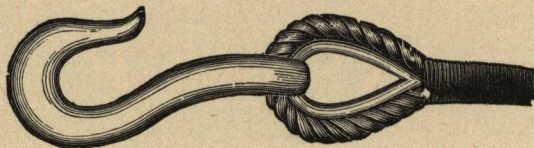
IRON.*

Hoisting Rope—Nineteen Wires to the Strand.

Trade No.	Diameter in inches.	Circumference in inches.	Circumference of Hemp Rope of equal strength.	Weight per foot in lbs. of Rope with Hemp Cen.	Breaking strain in tons of 2,000 lbs. Iron.*	Proper Working load in tons of 2,000 lbs.	Min. size of drum or sheave in feet.	Price, per foot, in cents.
1	2 $\frac{1}{4}$	6 $\frac{3}{4}$	15 $\frac{1}{2}$	8.00	74	15	8	1 22
2	2	6	14 $\frac{1}{2}$	6.30	65	13	7	96
3	1 $\frac{3}{4}$	5 $\frac{1}{2}$	13	5.25	54	11	6 $\frac{1}{2}$	84
4	1 $\frac{1}{2}$	5	12	4.10	44	9	5	68
5	1 $\frac{1}{8}$	4 $\frac{3}{8}$	11 $\frac{1}{2}$	3.65	39	8	4 $\frac{3}{4}$	62
5 $\frac{1}{2}$	1 $\frac{3}{8}$	4 $\frac{3}{8}$	10 $\frac{1}{4}$	3.00	33	6 $\frac{1}{2}$	4 $\frac{1}{2}$	52
6	1 $\frac{1}{4}$	4	7 $\frac{1}{2}$	2.50	27	5 $\frac{1}{2}$	4	44
7	1 $\frac{1}{8}$	3 $\frac{1}{2}$	8	2.00	20	4	3 $\frac{1}{2}$	36
8	1	3 $\frac{1}{4}$	7	1.58	16	3	3	29
9	$\frac{7}{8}$	2 $\frac{3}{4}$	6	1.20	11.5	2 $\frac{1}{2}$	2 $\frac{3}{4}$	23
10	$\frac{3}{4}$	2 $\frac{1}{4}$	5	0.88	8.64	1 $\frac{1}{4}$	2 $\frac{1}{2}$	18
10 $\frac{1}{2}$	9-16	2	4 $\frac{1}{2}$	0.70	5.13	1 $\frac{1}{4}$	2	15
10 $\frac{3}{4}$	$\frac{5}{8}$	1 $\frac{5}{8}$	4	0.44	4.27	$\frac{3}{4}$	1 $\frac{3}{4}$	12 $\frac{1}{2}$
10 $\frac{7}{8}$	$\frac{1}{2}$	1 $\frac{1}{2}$	3 $\frac{1}{2}$	0.35	3.48	$\frac{1}{2}$	1 $\frac{1}{4}$	10
10a	7-16	1 $\frac{3}{8}$	3 $\frac{1}{4}$	0.29	3.10	$\frac{3}{8}$	1 $\frac{1}{4}$	9 $\frac{1}{2}$
10 $\frac{7}{8}$	$\frac{3}{8}$	1 $\frac{1}{4}$	3	0 26	2.50	$\frac{1}{4}$	1	9

*Bessemer or Siemens Martin Rope at the same price as Iron Rope. Their breaking strain is about one-fourth greater.

HOOK AND THIMBLE.




DIAMETER.	FOR STEEL ROPE.		For Iron, Bessemer or Galv'd Rope.		DIAMETER.	FOR STEEL ROPE.		For Iron, Bessemer or Galv'd Rope.	
	Loose.	Fast'd.	Loose.	Fast'd.		Loose.	Fast'd.	Loose.	Fast'd.
1½.....	\$4 00	\$7 00	\$3 40	\$6 00	¾.....	\$1 75	\$3 75	\$1 50	\$3 00
1¼.....	3 25	5 75	2 50	4 75	¾.....	1 60	3 25	1 30	2 60
1.....	2 50	5 00	2 00	4 00	½.....	1 25	2 75	1 20	2 25
¾.....	2 00	4 25	1 75	3 50	¾.....	90	2 25	1 00	1 85

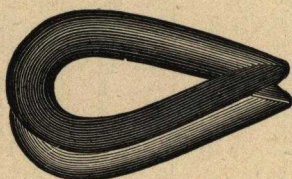
SISTER HOOKS.



DIAMETER.	FOR STEEL ROPE.		For Iron, Bessemer or Galv'd Rope.		DIAMETER.	FOR STEEL ROPE.		For Iron, Bessemer or Galv'd Rope.	
	Loose.	Fast'd.	Loose.	Fast'd.		Loose.	Fast'd.	Loose.	Fast'd.
1½.....	\$4 00	\$7 00	\$3 40	\$6 00	¾.....	\$1 75	\$3 75	\$1 50	\$3 00
1¼.....	3 25	5 75	2 50	4 75	¾.....	1 60	3 25	1 30	2 60
1.....	2 50	5 00	2 00	4 00	½.....	1 25	2 75	1 10	2 15
¾.....	2 00	4 25	1 75	3 50	¾.....	90	2 25	75	1 60

OVAL THIMBLE SPLICED IN.

	Diam. of Rope.	For Cast Steel Rope.	For Iron, Bessemer or Galv'd Rope.
	1½.....	\$4 75	\$4 00
	1¼.....	3 50	3 00
	1.....	3 00	2 50
	¾.....	2 50	2 10
	¾.....	2 10	1 75
	¾.....	1 80	1 50
	½.....	1 60	1 30
	¾.....	1 40	1 10

EXTRA HEAVY OVAL WIRE ROPE THIMBLES,
GALVANIZED.

Diameter of Rope.	Price Each.
¼	10 cts.
⅝	10 "
¾	10 "
1	12 "
1¼	12 "
1½	14 "
1¾	15 "
2	16 "
2½	18 "
3	20 "
3½	25 "
4	30 "
4½	35 "
5	40 "

CLOSED SOCKETS.



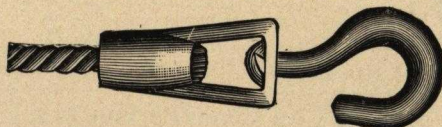
DIAMETER.	FOR STEEL ROPE.		For Iron, Bes-semer or Galv'd Rope.		DIAMETER.	FOR STEEL ROPE.		For Iron, Bes-semer or Galv'd Rope.	
	Loose.	Fast'd.	Loose.	Fast'd.		Loose.	Fast'd.	Loose.	Fast'd.
2 1/4	\$19 00	\$22 00	\$14 75	\$17 75	1 1/8	\$4 30	\$5 80	\$3 00	\$4 50
2	16 50	19 00	12 00	14 50	1	3 50	5 00	2 50	4 00
1 3/4	14 25	16 50	10 00	12 25	7/8	3 00	4 30	2 00	3 30
1 1/2	12 00	14 00	8 00	10 00	3/4	2 50	3 70	1 60	2 80
1 1/4	10 00	12 00	6 00	8 00	5/8	2 00	3 00	1 35	2 35
1 1/8	8 00	9 75	4 30	6 05	1/2	1 60	2 40	1 10	1 90
1	6 00	7 50	3 50	5 00	3/8	1 50	2 10	1 00	1 60

OPEN SOCKETS.



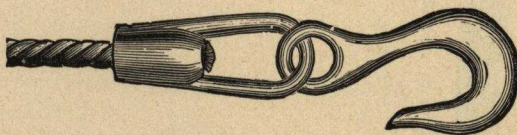
DIAMETER.	FOR STEEL ROPE.		For Iron Bes-semer or Galv'd Rope.		DIAMETER.	FOR STEEL ROPE.		For Iron, Bes-semer or Galv'd Rope.	
	Loose.	Fast'd.	Loose.	Fast'd.		Loose.	Fast'd.	Loose.	Fast'd.
2 1/4	\$22 00	\$25 00	\$16 50	\$19 00	1 1/8	\$5 30	\$6 80	\$3 75	\$5 25
2	19 00	21 50	14 00	16 50	1	4 25	5 75	3 20	4 70
1 3/4	16 50	18 75	11 75	14 00	7/8	3 75	5 05	2 70	4 00
1 1/2	14 00	16 00	9 50	11 50	3/4	3 20	4 40	2 25	3 45
1 1/4	11 75	13 75	7 25	9 25	5/8	2 70	3 70	2 00	3 00
1 1/8	9 50	11 25	5 30	7 05	1/2	2 25	3 05	1 75	2 55
1	7 25	8 75	4 25	5 75	3/8	2 00	2 60	1 60	2 20

SWIVEL HOOKS.



DIAMETER.	FOR STEEL ROPE.		For Iron, Bes-semer or Galv'd Rope.		DIAMETER.	FOR STEEL ROPE.		For Iron, Bes-semer or Galv'd Rope.	
	Loose.	Fast'd.	Loose.	Fast'd.		Loose.	Fast'd.	Loose.	Fast'd.
1 1/2	\$13 00	\$15 00	\$9 00	\$11 00	7/8	\$5 50	\$6 80	\$4 50	\$5 80
1 1/4	11 00	12 75	7 30	9 05	3/4	5 00	6 20	4 10	5 30
1 1/8	8 50	10 00	6 00	7 50	5/8	4 50	5 50	3 85	4 85
1	6 75	8 25	5 45	6 95	1/2	4 00	4 80	3 50	4 30
3/4	6 00	7 50	5 00	6 50	3/8	3 50	4 10	3 00	3 60

HOOK AND SOCKET.



DIAMETER.	FOR STEEL ROPE.		For Iron, Bes-semer or Galv'd Rope.		DIAMETER.	FOR STEEL ROPE.		For Iron, Bes-semer or Galv'd Rope.	
	Loose.	Fast'd.	Loose.	Fast'd.		Loose.	Fast'd.	Loose.	Fast'd.
1 1/2	\$8 25	\$9 60	\$5 75	\$7 10	7/8	\$4 05	\$5 15	\$3 05	\$4 15
1 1/4	6 75	8 15	5 00	6 45	3/4	3 50	4 50	2 70	3 65
1 1/8	5 50	6 75	4 25	5 50	5/8	3 00	3 75	2 50	3 25
1	4 75	6 00	3 65	4 90	1/2	2 50	3 25	2 00	2 75

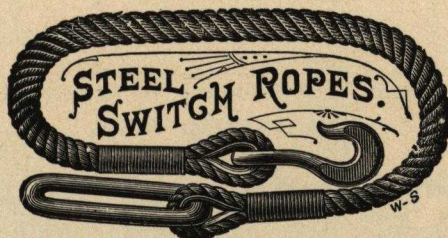
GALVANIZED WIRE GUY RODS.



FOR SMOKE STACKS, ELECTRIC LIGHTS, ETC.

7 Wires, No.	Diameter, Inches.	Weight per 100 feet, Lbs.	Price per 100 feet.	7 Wires, No.	Diameter, Inches.	Weight per 100 feet, Lbs.	Price per 100 feet.
8	$\frac{1}{4}$	52	\$4 00	15	$\frac{1}{4}$	10	\$1 00
9	$\frac{3}{16}$	42	3 40	16	$\frac{3}{16}$	8	90
10	$\frac{1}{8}$	36	3 00	17	$\frac{1}{8}$	6	75
11	$\frac{7}{16}$	29	2 45	18	$\frac{3}{8}$	$4\frac{3}{8}$	52
12	$\frac{1}{2}$	21	1 90	19	$\frac{1}{2}$	$3\frac{1}{2}$	43
13	$\frac{5}{8}$	16	1 50	20	$\frac{5}{8}$	$2\frac{1}{2}$	33
14	$\frac{3}{4}$	12	1 15	21	$\frac{3}{4}$	2	30

STEEL SWITCH ROPES.



30 FEET, COMPLETE	Equal to Manilla.	Breaking Strain in Tons.	Price, each.
1 inch diameter.....	2 $\frac{3}{8}$	24	\$14 00
1 $\frac{1}{8}$ " "	3	31	16 00
1 $\frac{1}{4}$ " "	4	41	18 00

"POWER" SWITCH ROPES.

For Extra Heavy Strains.

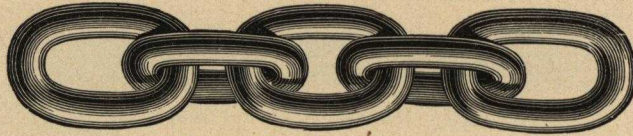
30 FEET COMPLETE.

1 inch diameter, guaranteed breaking strain 37 tons.....		\$16 50
1 $\frac{1}{8}$ " " " " " 47 "		18 00
1 $\frac{1}{4}$ " " " " " 60 "		25 00

MANILA SWITCH ROPES.

30 FEET COMPLETE.	Breaking Strain in Tons.	Price, Each.
2 $\frac{1}{4}$ -inch diameter.....	18	\$18 00
2 $\frac{1}{2}$ " "	21	20 00
3 " "	30	24 00
3 $\frac{1}{2}$ " "	40	28 00

CHAINS.



Straight Coil.



Twist Coil.

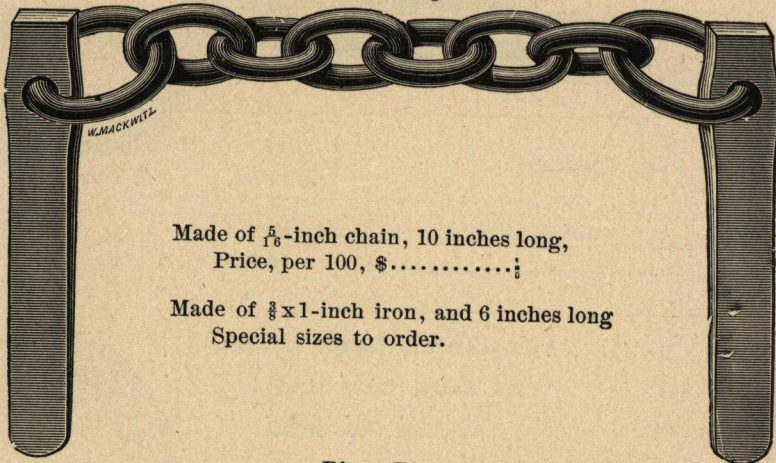
WEIGHT AND STRENGTH OF CHAINS.

Inch.	Weight per Foot.	Safe Weight in lbs.	Inch.	Weight per Foot.	Safe Weight in lbs.
$\frac{1}{8}$	.17	250	$\frac{5}{8}$	4.00	6,250
$\frac{1}{6}$	.38	560	$\frac{1}{2}$	4.84	7,550
$\frac{1}{4}$	.67	1,000	$\frac{3}{4}$	5.75	9,000
$\frac{1}{2}$	1.08	1,560	$\frac{1}{2}$	6.00	10,500
$\frac{3}{4}$	1.55	2,250	$\frac{1}{2}$	7.83	12,250
$\frac{1}{2}$	2.11	3,050	$\frac{1}{2}$	9.40	14,000
$\frac{1}{2}$	2.70	4,000	$\frac{1}{2}$	10.07	16,000
$\frac{1}{2}$	3.42	5,050			

Straight or Twist, same price, to $\frac{7}{8}$ inclusive. Write for prices.

LOG RAFTING DOGS.

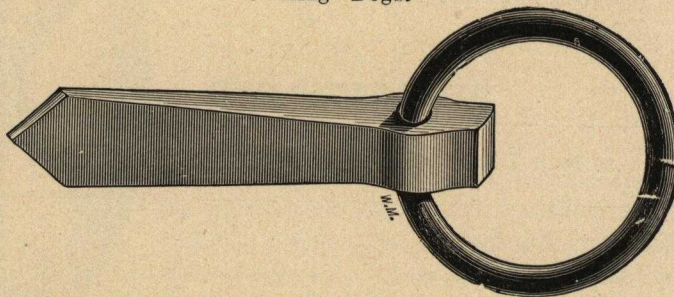
Chain Dogs.



Made of $\frac{5}{8}$ -inch chain, 10 inches long,
Price, per 100, \$.....

Made of $\frac{3}{4}$ x 1-inch iron, and 6 inches long
Special sizes to order.

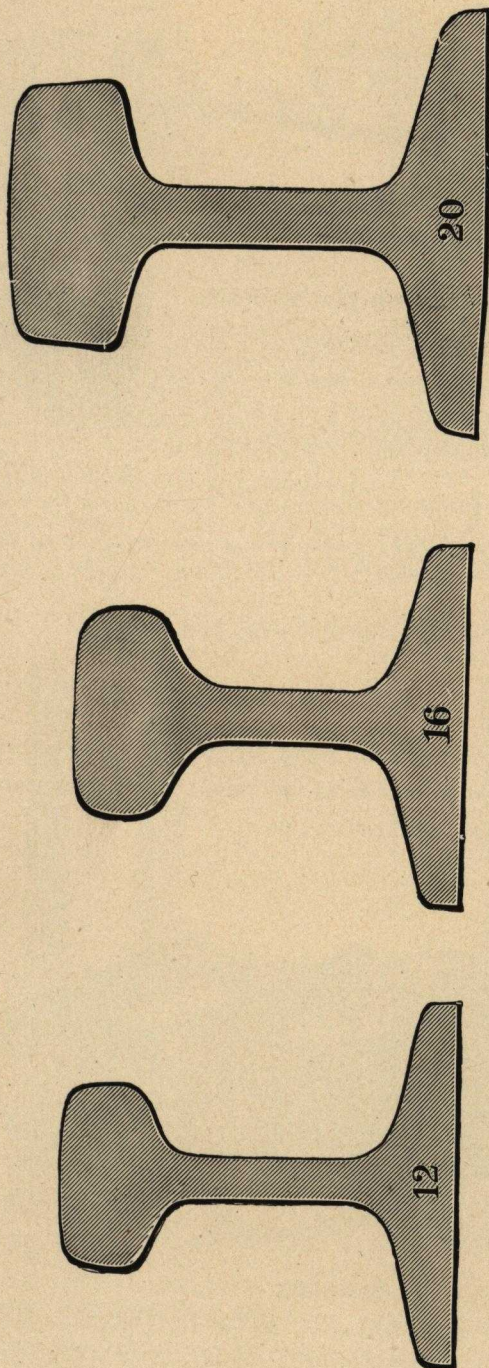
Ring Dogs.



1-inch square iron, 7 inches long. Ring of $\frac{1}{2}$ -inch iron, 3 inches inside diameter. Special sizes to order.

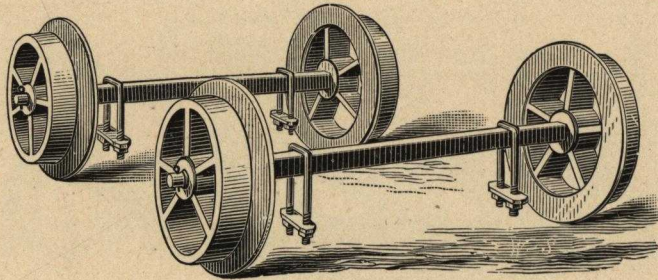
Owing to frequent fluctuations in prices we give estimates on application.

LIGHT RAIL.



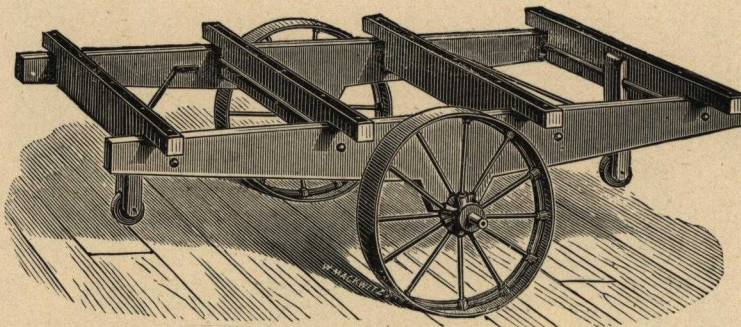
PER MILE.

Rail.	Tons, 2,000 lbs.	Splices.	Weight.	Bolts.	Weight.	Spikes.	Weight.
12 lb.....	21.12	1,056	2 lbs. each.	2,112	$\frac{1}{4}$ lb.	11,254	$2\frac{1}{2}$ oz.
16 ".....	28.16	1,056	2 " "	2,112	$\frac{1}{4}$ "	11,254	$2\frac{1}{2}$ "
20 ".....	35.20	1,056	2 " "	2,112	$\frac{1}{4}$ "	11,254	$2\frac{1}{2}$ "

**LUMBER AND LOG TRUCKS.**

10 inch flanged wheels and axles.....	per set, \$12 00
12 " " " light, for lumber.....	" 15 00
12 " " " heavy, for logs.....	" 18 00
15 " " " light, for lumber.....	" 20 00
15 " " " heavy, for logs.....	" 23 00
20 " " " heavy	" 38 00
24 " " " heavy	" 48 00

The above prices are for irons only (no wood work), consisting of 4 wheels, 2 axles and 4 stirrups. Our wheels have wide tread and are very heavy and strong. Axles are square and turned at ends. Wheels are bored and drilled, and run loose on axle.

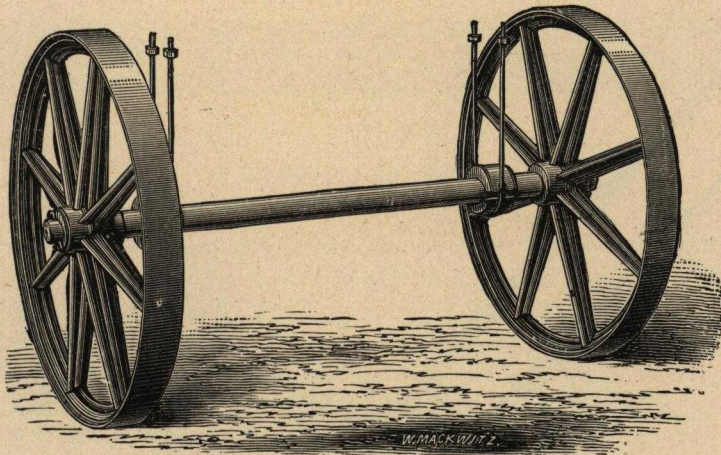
**LUMBER BUGGIES.**

For use in SAW MILLS, PLANING MILLS, STAVE FACTORIES and LUMBER YARDS.

Our regular Stock Buggy is 8 feet in length and 3 feet wide. Frames of selected yellow pine provided with wheels twenty-six inches in diameter, three inch face and wrought iron spokes, loose on axle.

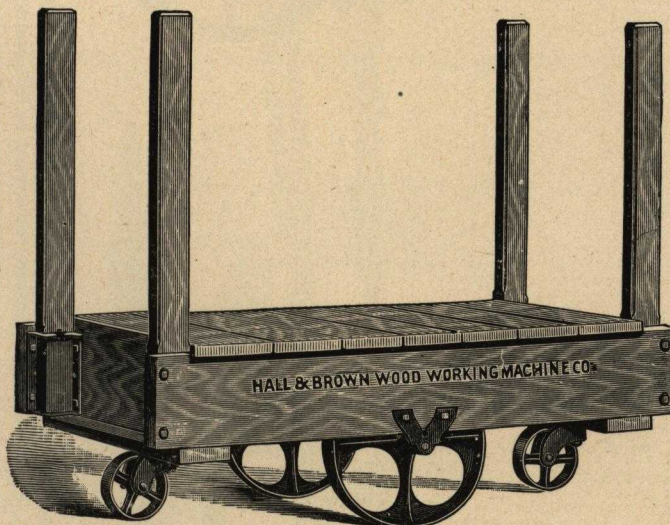
Price with wood work complete\$25 00 | Price Iron Work only..... \$17 00

LUMBER BUGGY WHEELS AND AXLES.



The Wheels are 24½ inches diameter, 2½ inches face.
 The Tire is made of heavy wrought iron, shrunk on a heavy casting.
 Distance between wheels, 31 inches. Axle 1½ inches. Body is usually made 8 feet long.
 We furnish irons complete, comprising two wheels and axle, stirrups, rods and top plates, for \$12 00
 Two 30-inch wheels, 3½ inch face, 2-inch axle 3 feet 3 inches long, complete as above..... 16 50

FACTORY AND WAREHOUSE TRUCKS.

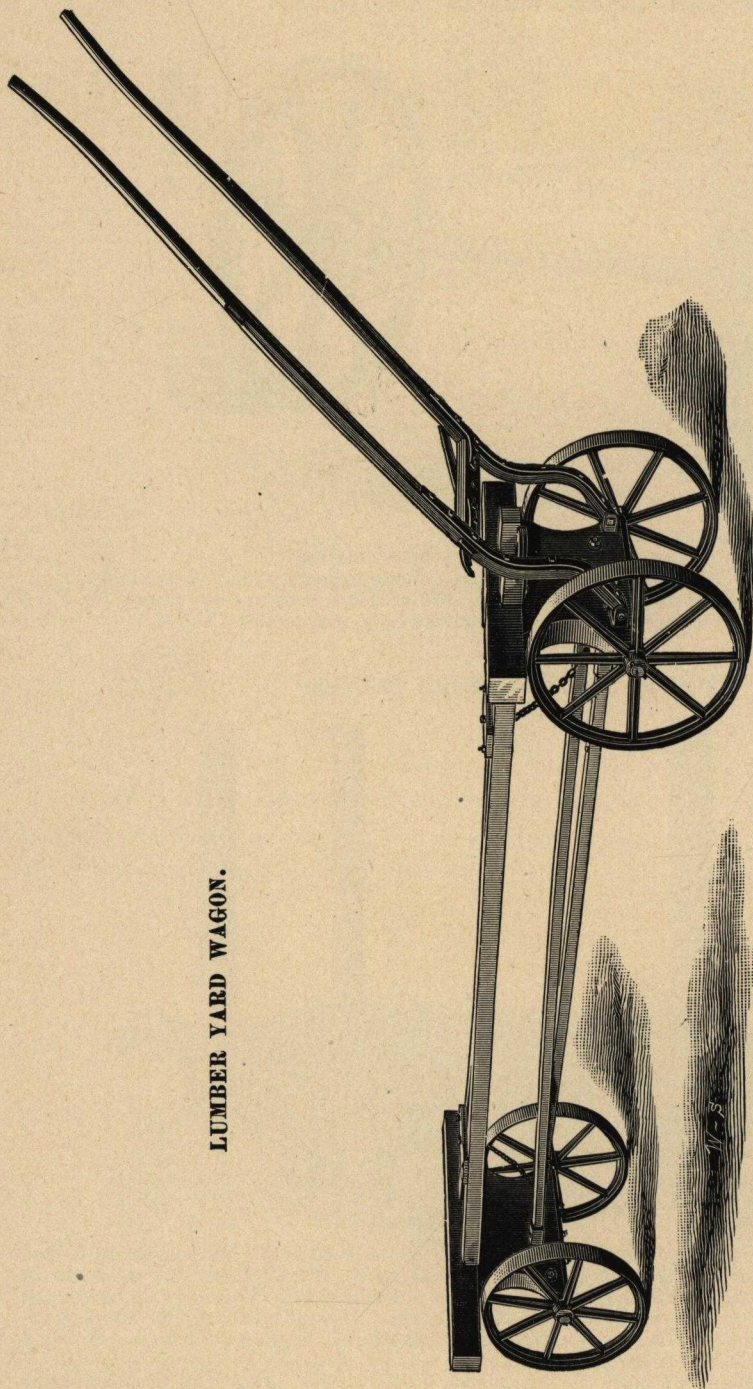


The above cut represents our Standard Factory Truck made expressly for use in mills and factories where cut lumber or material of any kind has to be moved from one machine to another or (when an elevator is used) from one floor to another. The Frame is of hardwood and very strong. Platform between Standards 48x28 inches. Height of Standards above platform 36 inches. Side Wheels 16 inches diameter, 2½ inches face. Steel Axle 1 inch. Heavy 6 inch Single Swivel Wheel under each end.

It does not require a man to handle the truck with a heavy load; a boy can handle it with ease. Any machine hand can do 25 per cent. more work in a day if you will give him our trucks to lay his work on, instead of laying it on the floor.

Price of Truck complete, each.....	\$5 50
Price of Iron Work per set for one Truck.....	4 00

LUMBER YARD WAGON.



This cut represents our new and improved Lumber Yard Wagon, for quickly moving lumber from Saw mill, dispensing entirely with hand lumber buggies. Mill men will do well to calculate the saving to be obtained in using this wagon instead of the regular hand lumber buggy.

The wheels are 30 inches in diameter, having cast spokes and wrought rims, the latter being $3\frac{1}{2}$ inches wide. The axles are 2 inches in diameter, with wheels loose on axles. The wagon is provided with two fifth-wheels, and so arranged that the hind wheels will track with those in front. Shafts are interchangeable for either end of wagon. The length from out to out of wagon is 12 feet 6 inches; width of bolsters is 4 feet 10 inches.

Can furnish wagon complete, or irons only. Prices will be submitted on application.

SHINGLE AND HEADING BANDS.

REFINED IRON, CUT WITH THE GRAIN.

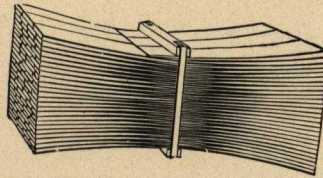
Black Shingle Bands.

From several years actual experience we can safely say that we have solved the problem of manufacturing *perfect* Shingle Bands, which will stand the hard usage they are put to by all Shingle Manufacturers and Dealers. We buy the best Sheet Iron, carefully inspect it before cutting, cut *every band* with the grain of the Iron, and use the utmost care in cutting and punching, and rigidly inspect the Bands before they are packed, so we can fully guarantee *every Band* to be *perfect*. Our Bands are all put up in boxes, just wide enough to take in the Bands, so that they lay straight and do not get mixed as when packed in barrels, and are easily taken out. Boxes weigh about 350 pounds each.

We use No. 24 Sheet Iron, but can cut No. 25 or No. 26 when desired. Can cut any length. Our machines for cutting and punching Bands are driven by power, so can fill orders promptly. Our capacity is three tons per day.

Heading Bands.

We manufacture these bands in large quantities and can cut them from 15 to 26 inches long, or longer if desired.



Painted Shingle Bands.

There is a growing demand for a Band which will not rust and which will not discolor the Shingles. To meet this demand we paint our own make Bands when desired, and can furnish same at an additional charge of $\frac{3}{4}$ c. per pound.

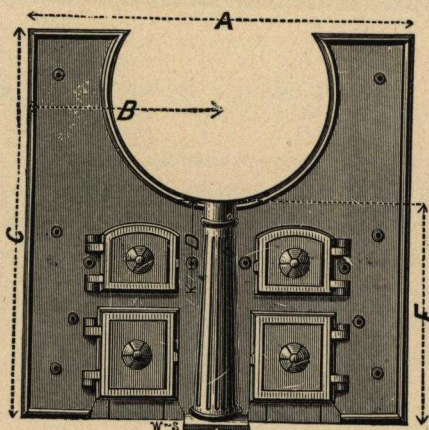
Galvanized Iron Shingle Bands.

We carry a large stock of 12, 13 and 14 inch Galvanized Iron Bands. They materially add to the appearance of a bunch of Shingles. Besides this, they will not rust, nor will they discolor the Shingles. Every Galvanized Band is cut *with* the grain.

Prices on Shingle and Heading Bands quoted upon application.

STANDARD FIRE FRONTS.

THREE-QUARTER STYLE.



Size Diameter of Boiler.	Front fitted complete.	For each additional Boiler in Battery.	Additional Parts—Extra.			
			Back Stand.	Back Bearing Bar.	Back Plate.	Soot Door and Frame.
60	\$55 00	\$40 00	\$2 35	\$2 70	\$6 40	\$3 75
54	50 00	38 00	2 35	2 35	5 85	3 75
48	43 70	31 00	2 35	1 90	5 25	3 75
46	43 00	30 00	2 35	1 90	5 25	3 75
44	42 00	30 00	2 35	1 90	5 25	3 75
42	33 35	25 50	2 35	1 75	4 70	3 75
40	32 50	24 00	2 35	1 75	4 70	3 75
38	29 00	20 00	1 75	1 50	3 50	3 75
36	28 15	19 00	1 75	1 50	3 50	3 75

Complete Front includes liner boxes, liner plates, front bearing bars and brackets.
 A full stock of Standard Fronts kept on hand to insure prompt shipments.
 Quotations on Full and Full Flush Fronts made on application.

DIMENSIONS OF FIRE FRONTS.

Diameter of Boiler.	A	B	C	D	E
60	98	49	91	24	47½
54	89	44½	84	20	45
52	89	44½	84	20	45
50	89	44½	84	20	45
48	78	39	80½	22	48
46	78	39	80½	22	48
44	78	39	80½	22	48
42	73½	36½	74½	20	45
40	73½	36½	74½	20	45
38	65	32½	62½	16	40
36	65	32½	62½	16	40

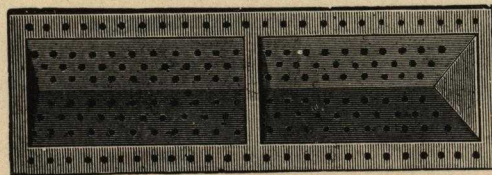
STANDARD GRATE BARS.



BOILER.	One Set, 5 ft.	One Set, 4½ ft.		One Set, 4 ft.		One Set, 3½ ft.		One Set, 3 ft.	
	¾-inch Opening.	¾-inch Opening.	½-inch Opening.	¾-inch Opening.	½-inch Opening.	¾-inch Opening.	½-inch Opening.	¾-inch Opening.	½-inch Opening.
60	\$41 90	\$34 45	\$44 00	\$30 00	\$42 00	.....	.....	.....	.....
54	38 50	31 80	40 75	27 00	39 00	\$20 00	\$28 00	.....	.....
52	37 33	30 91	39 70	26 35	38 00	19 40	27 30	.....	.....
50	36 17	30 03	38 60	25 65	37 00	18 75	26 65	.....	.....
48	35 00	29 15	37 60	25 00	36 00	18 15	26 00	\$18 00	\$22 00
46	34 50	28 25	36 55	24 55	35 00	17 60	25 35	17 50	21 75
44	34 00	27 40	35 50	24 15	34 00	17 05	24 65	17 00	21 50
42	33 50	26 50	34 45	28 75	33 00	16 50	24 00	16 50	21 30
40	31 30	24 75	32 35	22 35	31 00	15 40	22 65	15 50	20 00
38	29 05	22 95	30 30	21 00	29 00	14 30	21 35	14 50	18 70
36	26 80	21 20	28 20	19 60	27 00	13 20	20 00	13 50	17 40

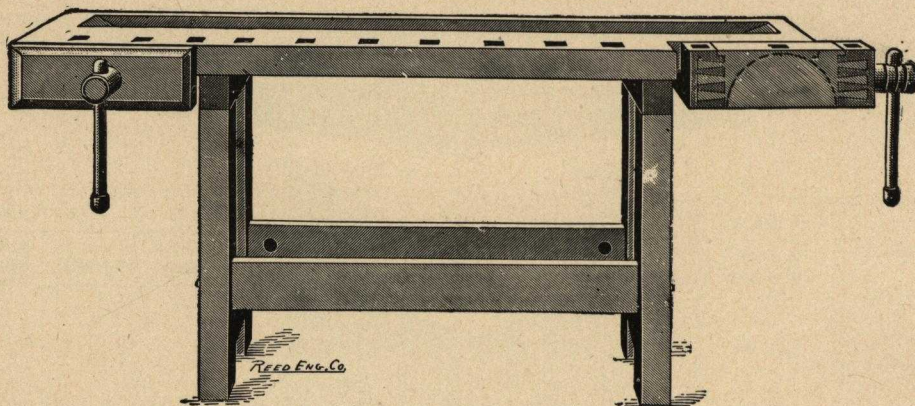
Special quotations made on irregular size and style Grates on application.
A full stock of Standard Grate Bars always kept in stock.

V-SHAPED SAWDUST GRATE BARS.



One V-Shaped Sawdust Grate Bar, 12 inches wide, 4 feet long..... \$4 80
We can furnish these Bars of any length and to fill any width space desired.

CABINET MAKER'S BENCH.



It has a glued up hard maple top $2\frac{3}{4}$ inches thick when finished. The legs are $2\frac{1}{2} \times 3\frac{1}{2}$ inches, also of maple.

The size of the regular bench is 25 inches wide (with 14 inch maple top), $6\frac{1}{2}$ feet long and 34 inches high.

The underside of front piece and upper side of front girt have a half inch groove to receive slides when wanted. These slides are not included in price of benches, but will be furnished for 50c. each, list.

We can fit the Massey Lightning Grip Vises when desired at \$4.00 net extra for each vise.

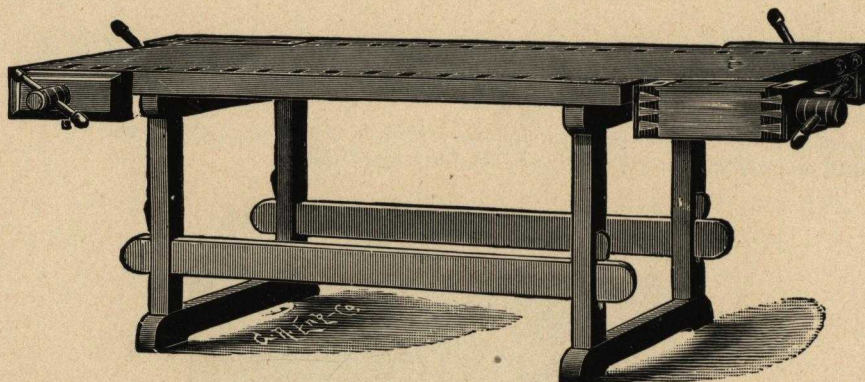
Iron bench stops will be furnished at \$1.00 per pair, list.

Benches made in special sizes when wanted.

PRICE LIST OF BENCHES.

Regular size Cabinet Bench.....	\$12 00
$6\frac{1}{2}$ feet long by 30 inches wide, with 16 inch maple top.....	13 00
7 feet long by 30 inches wide, with 16 inch maple top.....	14 00
Extra for Massey Lightning Grip Vise	4 00
Extra for Iron Bench Stops, per pair	1 00

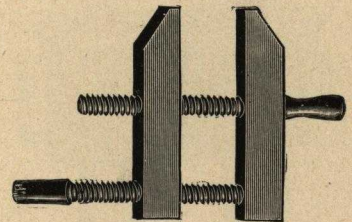
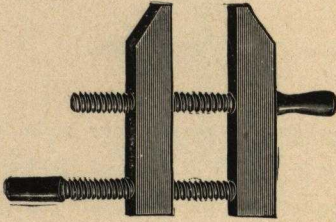
CABINET MAKER'S DOUBLE BENCH.



Designed for use in factories where space is limited, and it is desirable to locate benches in middle of room. They are also well adapted for special or large work. The bench is 7 feet long and 37 inches wide, with 11 inches pine center in top. Frame is put together with joint bolts instead of wooden keys, as shown.

Price\$20 00

HAND SCREWS.



No.	1	1½	2	3	4	5	6	7	8	9	10	11	12	13	14
Diameter Screw.....	½	¾	¾	¾	¾	¾	¾	1½	1½	1½	1½	1½	1½	1½	1½
Length of Screw.....	9	11	13	14	16	16	18	18	20	20	22	22	24	24	26
Length of Jaw.....	7	8½	10	12	12	14	14	16	16	18	18	20	20	24	24
Size of Jaw.....	1½x1½	1½x1½	1½x1½	1½x1½	1½x1½	2x2	2x2	2½x2½	2½x2½	2½x2½	2½x2½	2½x2½	2½x2½	2½x3	2½x3
Opens Inches.....	4	5	6½	8½	8½	8	10	9½	10½	10	12½	12	14	13½	15½
Price per Dozen.....	\$2 25	\$2 75	\$3 50	\$4 00	\$4 50	\$5 00	\$5 50	\$6 00	\$6 50	\$7 00	\$7 50	\$7 75	\$8 00	\$9 00	\$10 50

CABINET MAKERS' CASE CLAMPS.



Bars 1½x1½ inches.
Hole in head 1½ in. from bar to center.
The spindles are fitted with brass ferrules and iron block, the block being faced with leather to prevent marring the stock.

CABINET MAKERS' GLUE CLAMPS.

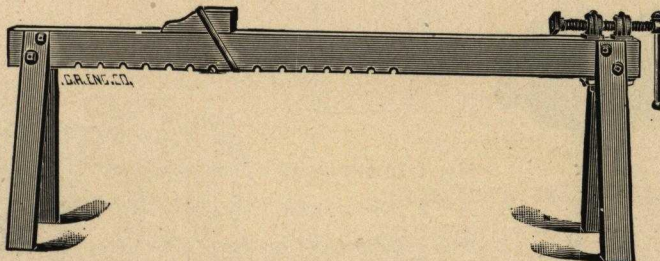


Bars 1½x2 inches.
Distance from Bar to center of first hole, one inch.
Spindles are fitted with brass ferrules and spuds.

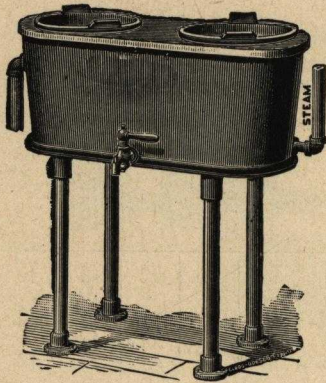
All bars and heads are made of kiln dried hard maple. Bars are dadoed to receive heads, which are also glued and riveted on. Spindles are made of second growth hickory ¾ in. diameter and 10 in. long.

No.	12	23	34	45	56	No.	22	33	44	55	66
Opens feet.....	2	3	4	5	6	Opens feet.....	2	3	4	5	6
Price, per Dozen.....	\$7 00	\$7 50	\$8 00	\$9 00	\$10 00	Price, per Dozen.....	\$7 50	\$8 00	\$8 50	\$9 50	\$10 50

CLAMP HORSES.



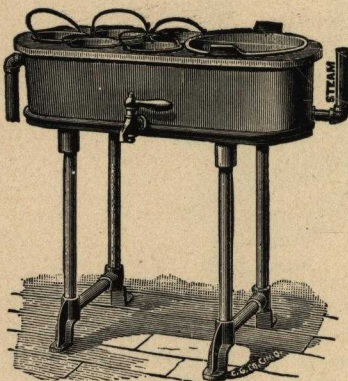
These Clamp Horses have hard maple bar or beam 3½x4 inches and double iron clamp head with 1½ inch screw. They will open six feet. Both bar and block are grooved out to receive strips for raising or lowering work to center of screw. When made in pairs the legs of one horse will set between those of the other when it is desired to bring the bars close together.
Price per pair.....\$7.00



No. 1.—Glue Heater.
Weight, 175 lbs.



No. 2.—Glue Heater.
Weight, 140 lbs.



No. 3.—Glue Heater.
Weight, 160 lbs.

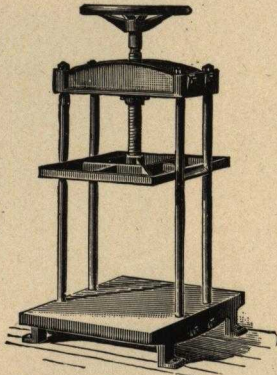
IMPROVED STEAM GLUE HEATERS.

The accompanying engravings represent our style of Heaters. The Tanks and Pots are made of the best cast iron. The inside Pots are heavily coated with the best white enamel and warranted not to crack or chip off. The steam enters the tank at one end, and near the bottom, passing through a pipe the length of the tank. This pipe has a cap on one end, and has twelve small holes drilled two inches apart to allow the discharge of steam into the water, thus preventing the water from splashing over, as is the case with other Heaters arranged to admit steam from one opening the full size of the pipe. We provide a large over-flow pipe at the other end of tank to allow the surplus water to pass out when it reaches this height. We also provide a Brass Bib Cock, as shown, for drawing hot water to thin out the glue, or for other purposes. All pipe connections are made *without* the use of gum washers or gaskets, and guaranteed to be steam tight. Either live or exhaust steam can be used for heating the glue. In many instances the Heaters are attached to a line of pipe leading from a drying box used for warming the wood before gluing. This will be found very convenient for the cabinet makers. The stands are made of cast iron, with gas pipe legs, which can be made any desired height. They are also removable and can be packed in a box with Heater for shipment. The low price we furnish our Heaters to the manufacturer leaves no excuse for trying to get along without them.

PRICE LIST.

No. 1 Heater, with 2 Enameled Pots, 3 gallons, each...	\$24 00
No. 1 Heater, with 3 Enameled Pots, 3 gallons, each...	32 00
No. 2 Heater, with 8 Enameled Pots, $\frac{1}{4}$ gallon, each....	24 00
No. 3 Heater, with 5 Enameled Pots, $\frac{1}{4}$ gallon, each, and one $1\frac{1}{4}$ gallon Pot.....	24 00
Stand for Heater.....	6 00

IRON FRAME VENEER PRESSES.



COMPLETE VENEER PRESS SMALL SIZE.

These engravings represent our improved Iron Frame Veneer Presses, which are rapidly taking the places of the old wood frame presses. They are all well made and so strong and substantial that it is almost impossible to put strain enough on to effect them.

The top surface of bases and lower surface of tops are planed true. The nuts that fit in top arch are faced off and bored and tapped in lathes, thus making the screws work square with base and top.

The arches of base and top have wrought-iron draw rods running across from side to side, thus adding much to their strength.

The extensions or foot pieces are all planed the same height.

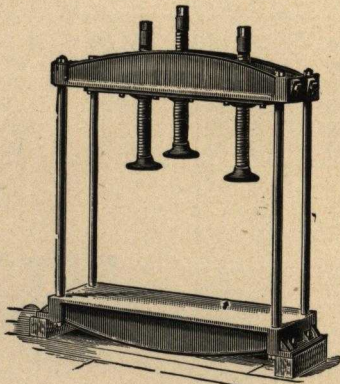
The base and arch on all these Presses are eight inches wide, except the sixty inch, which are ten inches wide.

These Presses are made full of the sizes given, so that stock the full width of their respective sizes may be worked in the Presses.

The Presses are made thirty-six inches high from top of base to lower side of top, leaving about thirty-two inches clear between base and lower end of screw.

All the SCREWS are made of good machinery steel, two inches in diameter, with square thread, and are all chased in lathes, thus securing a good, straight screw, and not straining the metal as a bolt-cutter does. The screws are thirty inches long in the sixty-inch Presses and twenty-four inches long in all the others.

The Nut is tapped out and has a thread-bearing six inches long, so that it is practically impossible to strip either the thread in the nut or on the screw.



SECTIONAL VENEER PRESS.

We can also if desired furnish the Screw Nut and Flange used in our Presses also the wrench. Price.....\$ 8 50

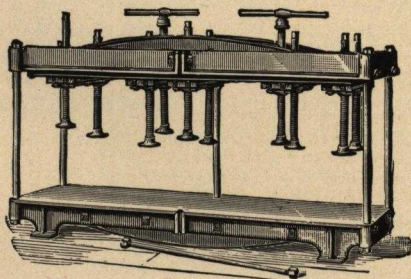


PRICE LIST.

SECTIONAL VENEER PRESSES.

Nos.	Sizes	No. of Screws.	Prices.
1	12 inches	1	\$ 17 00
2	18 "	2	22 00
3	24 "	2	26 00
4	28 "	2	28 00
5	32 "	2	30 00
6	38 "	3	40 00
7	44 "	3	50 00
8	52 "	3	70 00
9	60 "	4	100 00

COMPLETE VENEER PRESSES.



COMPLETE VENEER PRESS LARGE SIZE.

Nos.	Width of Base bet. Uprights.	Length of Base.	Dimension of Plate.	Prices.
12	12 inches	12 inches	12x12	\$ 37 50
13	12 "	18 "	12x15	40 00
14	18 "	18 "	18x18	44 00
16	24 "	24 "	24x24	47 00
17	24 "	30 "	24x24	50 00
23	24 "	8½ feet		230 00
24	24 "	10 "		235 00

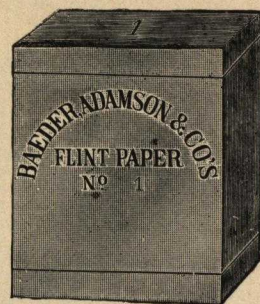
GARNET SAND AND EMERY PAPER.



PRICE LIST.

IN SHEETS 9x11.

Nos. 00 to 1½ and assorted.....	\$4.50	per Ream.
" 2, 2½ and 3.....	5.00	" "
" 3½.....	5.50	" "



IN ROLLS, 50 YARDS EACH.

PER ROLL.	23½ Inches Wide.	30 Inches Wide.	36 Inches Wide.	40 Inches Wide.	42 Inches Wide.	48 Inches Wide.
Nos. 00 to 1½.....	\$5.00	\$8.00	\$10.00	\$12.00	\$13.00	\$15.00
" 2.....	5.50	9.00	11.00	13.00	14.00	17.00
" 2½.....	6.00	10.00	12.00	14.00	15.00	18.00
" 3.....	6.50	11.00	13.00	15.00	16.00	20.00
" 3½.....	7.50	13.00	15.00	17.00	18.00	23.00
" 4.....	8.50	15.00	17.00	20.00	21.00	26.00

GARNET PAPER.

IN SHEETS 9x11.

Nos. 00 to 1½ and assorted.....	\$5.50	per Ream.
" 2.....	6.00	" "
" 2½.....	6.50	" "
" 3.....	7.00	" "

IN ROLLS, 50 YARDS EACH.

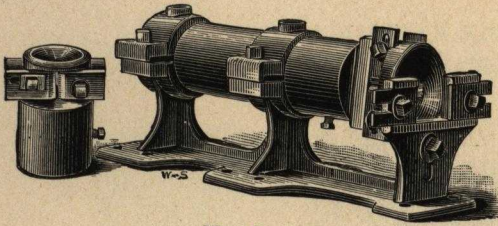
PER ROLL.	23½ Inches Wide.	30 Inches Wide.	36 Inches Wide.	40 Inches Wide.	42 Inches Wide.	48 Inches Wide.
Nos. 00 to 1½.....	\$6.00	\$9.00	\$11.00	\$13.00	\$14.00	\$18.00
" 2.....	6.50	10.00	12.00	14.00	15.00	20.00
" 2½.....	7.25	11.00	13.00	15.00	16.00	22.00
" 3.....	8.25	12.00	14.00	16.00	17.00	25.00
" 3½.....	9.50	14.00	16.00	18.00	19.00	29.00
" 4.....	10.50	16.00	18.00	21.00	22.00	32.00

EMERY PAPER.

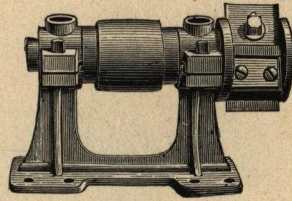
Nos. 00 to 1½ and assorted.....	\$ 6.50	per Ream.
" 2.....	7.50	" "
" 2½.....	9.50	" "
" 3.....	11.50	" "

EMERY CLOTH.

Nos. FF to 1½ and assorted.....	\$18.00	per Ream.
" 2.....	20.00	" "
" 2½.....	24.00	" "
" 3.....	26.00	" "
Crocus Cloth.....	18.00	" "



No. 1.



No. 2.

HAND ROUNDING MACHINES.

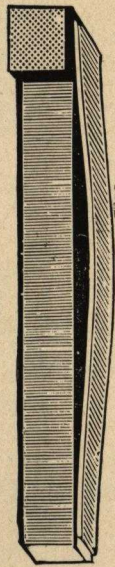
These Machines are for working Rods, Rollers, Dowell Pins, Stretchers, Handles, etc., and doing all kinds of Straight Turning. They have well constructed Heads and Cutters attached to a hollow arbor, through which the stock passes. Each machine is fitted with one Head with Cutters. A different Head is required for each size required to be turned.

No. 1 Machine turns from $\frac{1}{8}$ up to 2 inches.

No. 2 Machine turns from $\frac{1}{4}$ up to $\frac{3}{8}$ inch.

Price, No. 1, to work one size, \$25 00. Extra Heads, \$6 50 each.

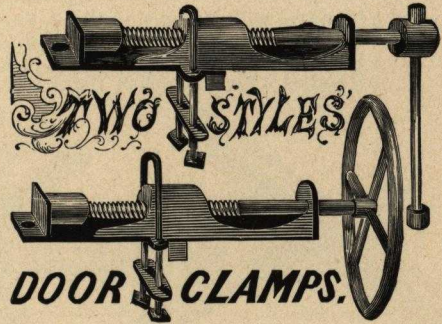
Price, No. 2, to work one size, \$10 00. Extra Heads, \$7 00 each.



BENCH DOG.

For cabinet makers.

Price, each, \$1.00.



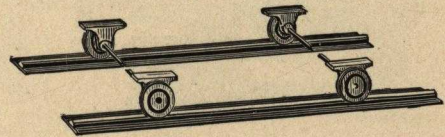
The Clamps are very heavy and strong, made in the manner indicated by the cuts, having an outside bearing to support the screw. Having fitted up tools expressly for manufacturing these screws, we are enabled to furnish them, either style, at the low price of \$3 50 each.



TRACK WITH SLIDES FOR SAW TABLES.

This style track is used extensively for different purposes, it is planed up true and the slides planed to match, and drilled for screw holes ready to fasten to the bench and table.

Price, 4 feet double track, with 6 slide pieces to match, \$4 00. Extra track planed up and drilled, per foot, 50 cts.



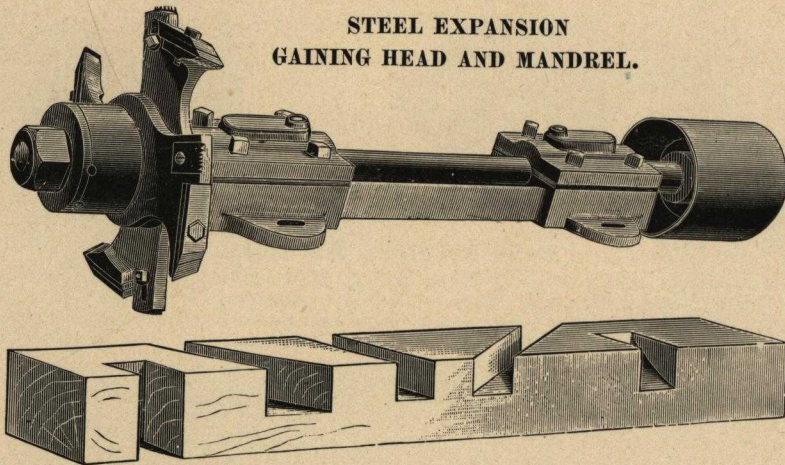
TRACK & ROLLERS FOR SAW CARRIAGES.

This track is planed up true, the rollers are 4 inch diameter and grooved to fit the track, and secured fast to the rods which are $\frac{1}{2}$ inch diameter and of any length desired; the rods working in Pipe Box Babbitted Journals at each end. This style of track is used for long carriages, for Cutting-off and Rip Saw Tables, and works very true and light.

Price of connected Rollers, 6 or 7 feet between track, with 5 feet double track, complete for Cutting-off Table, \$12 00.

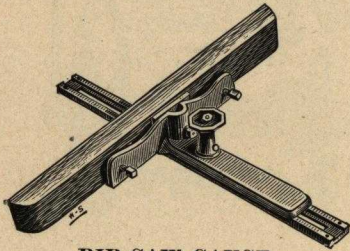
Rollers and track for edging Saw Tables according to size and number of rolls and length of track. Track planed up true and drilled, 50 cts. per foot.

STEEL EXPANSION GAINING HEAD AND MANDREL.

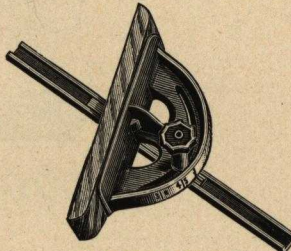


These Expansion Heads are so constructed that without the removal or a change of the cutters they can be adjusted to the slightest fraction and cut double their width.

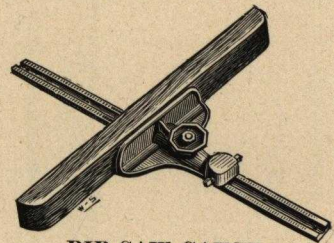
- No. 5 Mandrel with Expansion Head, to work from $\frac{3}{4}$ to $1\frac{1}{2}$. Price, \$40 00.
 No. 5 Mandrel with Expansion Head, to work from $\frac{1}{2}$ to $1\frac{3}{4}$. Price, 40 00.
 No. 6 Mandrel with Expansion Head, to work from $1\frac{1}{4}$ to $2\frac{1}{2}$. Price, 45 00.
 No. 6 Mandrel with Expansion Head, to work from 2 to 4 in. Price, 45 00.



RIP SAW GAUGE.

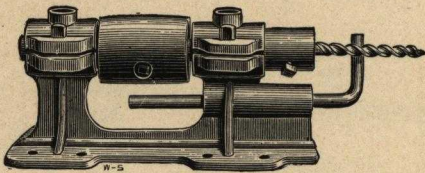


MITER GAUGE.
PRICE, \$5.00 each.



RIP SAW GAUGE.

A cheap, accurate, strong and durable gauge, for Planing Mills, Box and Furniture Factories, etc. The guide-plate can be made to suit width of table. We also make a Superior Bevel Saw Gauge when desired. Price, \$6.00.

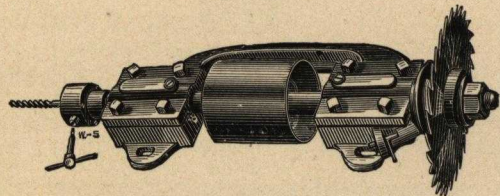


BENCH BORING MACHINE.

PRICE, \$10.00.

This shaft is fitted with a small iron frame with Babbitt boxes, and may be attached to a bench or other convenient place to apply the power. It is used for Boring blind stiles or any small holes. The pulley on shaft is $2\frac{1}{2}$ inches in diameter, and $3\frac{1}{2}$ inch face.

One bit will be furnished with each machine.



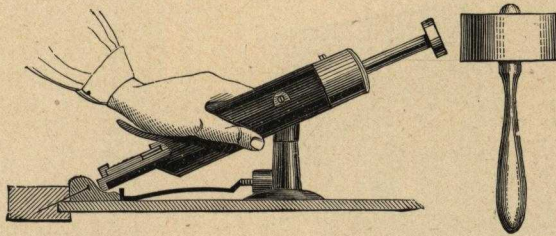
No. 4 MANDREL.

Arranged with Wobble Collars and Boring Chuck.

A mandrel arranged in this manner will be found very convenient for those with limited means or space, as sawing, tonguing, grooving, gaining, boring, etc., can be accomplished with a mandrel arranged in this manner.

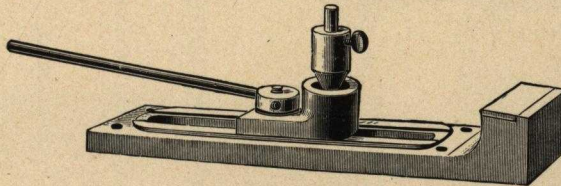
A planer-head can also be used in place of the wobble collar if desired.

Price of Mandrel as arranged above, with Danbury chuck,	\$24 00
Price with common \$4.00 chuck,	20 00
“ “ set screw chuck,	17 50
“ mandrel without chuck,	16 00
“ mandrel without chuck or wobble collars,	12 00

IMPROVED BRAD DRIVER.

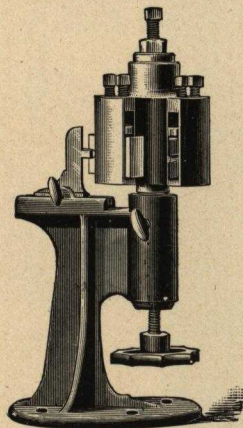
This Brad Driver is the only successful machine of its kind ever placed on the market for brading or nailing door mouldings.

The machine is very simple. It is provided with two loaders, that hold the brads or nails; and to work the machine advantageously, a boy should attend to filling them with brads, so that when the operator has completed a door, the boy has the other loader filled and ready for use. The machine drives and sets the brads as quickly as the operator can use the mallet, and in experienced hands there is a great saving of time, to say nothing about the ease and perfection of work, which it would be difficult to attain in the ordinary way of driving and setting brads in mouldings. Price.....\$15.00.

CIRCULAR SAW SETTING MACHINE.

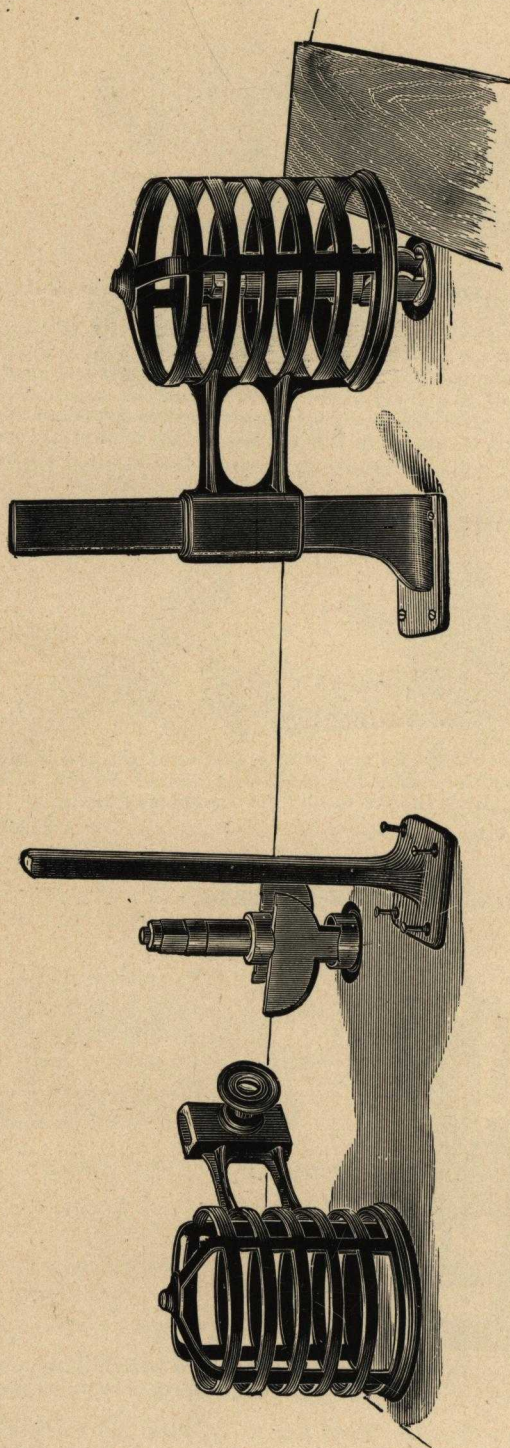
The machine has a steel face Anvil Block, giving the proper degree of set, and is provided with a conical stud which will fit saws with holes from $\frac{3}{4}$ to $1\frac{1}{2}$ diameter or larger, if so ordered, which is adjusted to or from the Anvil Blocks to suit the diameter of saw.

Price.....\$12.00.

MACHINE FOR SETTING MATCHER CUTTERS.

This machine is made for setting the cutters in Matcher Heads. It is perfectly adapted to the purpose for which it is designed, quickly adjusted to suit all sizes of cutters, a great labor-saving machine considering its cost.

The cut represents a machine with a Matcher Head on it, showing the manner in which the cutters are set. Price.....\$12.00.



SAFETY GUARD FOR UPRIGHT MOULDING MACHINES.

The upright Moulder or Shaper is and always has been considered a dangerous machine to operate, therefore a careful experienced man was necessary to run this machine with safety.

The above cut represents a guard which insures complete protection to the operator.

Its simplicity of construction and ease of application and adjustment should be carefully considered. Lower priced men and even boys can operate this machine with the guard as well as high priced men without it.

It can be applied to any table and can be used as a pressure bar with light pressure, thus holding work more firmly and doing better work with the machine.

PRICE, PER PAIR, \$10.00.

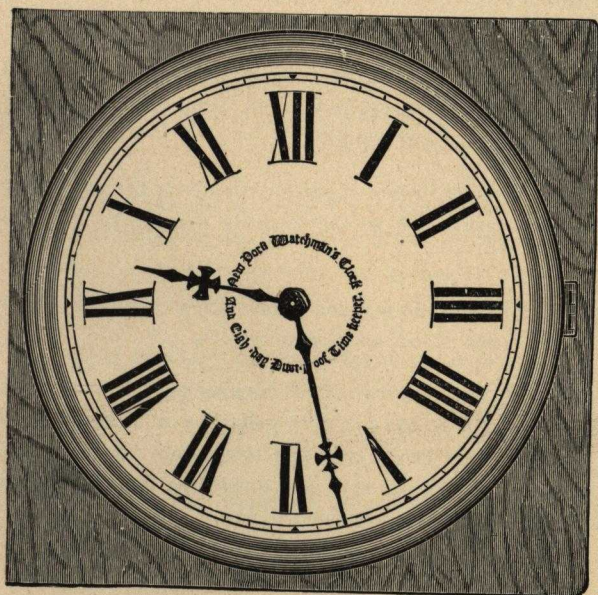
NEWMAN'S PATENT WATCHMAN'S TIME CONTROLLER.



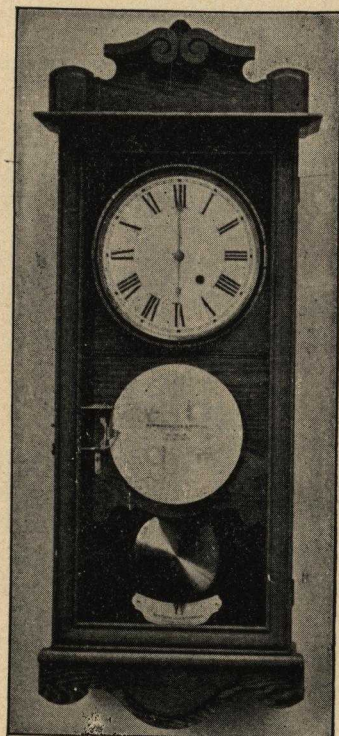
A WATCHMAN UNDER CONTROL.



A WATCHMAN UNCONTROLLED.



SQUARE CLOCK 14x14, 2 DAY DIAL.



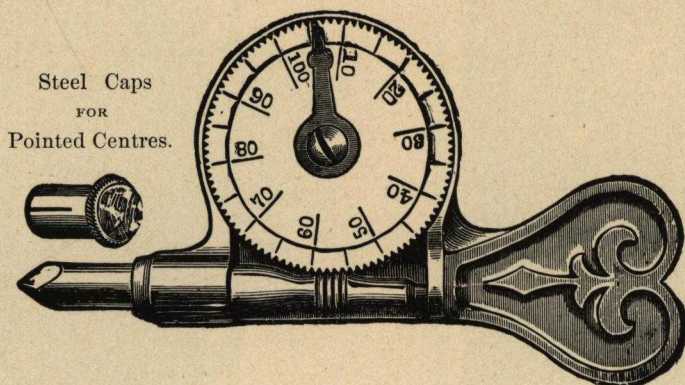
REGULATOR NO. 1.

A GOOD TIME KEEPER AND WATCHMAN'S CLOCK.

The Newman's Patent Watchman's Clock is intended to meet the requirements of any who may need such an instrument for regulating and controlling time, and keeping a check on operatives and watchmen. We feel in offering these Clocks that they are the most reliable and accomplish their object the best of any yet introduced. A year's supply of Dials furnished with each clock.

Price, Square Clock.....	\$16 00
Price, No. 1 Regulator.....	20 00

Send for descriptive circular.

**SPEED INDICATOR.**

FULL SIZE.

Correct and reliable. Any speed can be accurately counted.

PRICE, - - - \$1 00.

CALCULATIONS FOR SPEED AND DIAMETER OF PULLEYS.

When the same belt runs over two pulleys, (driver and driven) pay attention to these facts: that the diameter and speed of one pulley are always known; that one of these quantities of the other pulley is known, and the other quantity, speed or diameter is required. Drop the distinction of "driver" and "driven." Then, to calculate either speed or diameter:

RULE.—Multiply together the speed and diameter known of one pulley; divide the product by the known quantity of the other pulley, the result will be the quantity sought, be it speed or diameter.

Represent your diameter in inches, and your speed in number of revolutions per minute, and the answer will be either in inches, or revolutions per minute as the case may be.

EXAMPLE.—You put a machine in your mill, and your main shaft running say 300 turns, what diameter of pulley is required to drive the machine? Say the tight pulley has a diameter of 10 inches, and should run 900 revolutions; both quantities being known of this pulley, you apply the rule, and multiply them together: 900×10 gives a product of 9000, this divided by 300, the known quantity of the other pulley, gives a result of 30, which is the diameter sought.

BLIND STAPLES.

Made of coppered steel wire, and barbed in a superior manner, in 5 or 10 pound boxes,

per pound.....	\$ 12
50 pounds in one lot.....	5 00
100 " "	10 00

Hints to Owners and Operators of Wood-working Machinery.

To insure the successful working of any kind of machinery, and particularly the class devoted to wood-working, it is obvious that a certain amount of skill and care is required. We have frequently seen mills fitted up with first-class machines turning out poor work, costing much for repairs, and worn out in a short time and the blame laid on the makers, when it should have been borne by the owners for not furnishing tools and conveniences, and by the foreman or workmen running the machine, for the careless and slovenly manner in which it is kept.

There is nothing mysterious in wood-working machinery; cause and effect govern it (as with all material things), and a machine which works well to-day, will, if kept in order, work well until worn out.

Every wood-working establishment should have a work bench with iron vise files, hammers, cold chisels, monkey wrench, screw driver, square steel straight edge balancing scales, oil cans, ladle for melting babbitt, a set of belt tools for studs, hooks and lacing, etc. Without such tools no man can do justice either to the machine in his charge or to himself. There is no excuse except ignorance for running a machine out of order.

We desire to call particular attention to the necessity of oiling freely, particularly when the machine is new, and be sure the oil holes are all carefully picked out with a wire kept for that purpose.

A vast amount of mischief is occasioned by using poor oil. The market is flooded with cheap lubricants which are but very little better than water, and should never be used on this class of machinery. Pure lard oil is the best, although we can furnish a very superior lubricating oil at a very low figure.

Take up all lost motion oil freely and regularly, keep your heads and cutters well balanced, or no machine can do good work.

Speed of Wood-working Machines.

Late improvements admit the cutting edges of Planing and Moulding knives to move at the rate of 8000 feet per minute. Lumber is fed to these cutting edges at the rate of 15 to 100 feet per minute, according to quality of the wood, hard or soft, and quality of the work required. The velocity of circular saw teeth is about 9000 feet per minute. Some first-class saw mills now exceed that. Band-saw teeth, up to $\frac{3}{8}$ wide, are now doing their best at about 4000 feet per minute.

How Planer Cylinders Should be Made.

Planer Cylinders should be made of steel or wrought iron, and in no case should a head for a wide machine be made of cast iron, as it is almost impossible to balance it properly ; and if slotted it is dangerous. Manufacturers differ somewhat in regard to the best method of construction. Some contend that the wrought or forged steel head should be bored and the steel shaft of the very best quality be forced in, while others, that the steel head and shaft be forged solid in one piece ; we prefer the latter method.

Trueing up the Journals of Planer Cylinders.

In time the journals of your Cylinders will become worn out of round and will require to be turned up true. It is of the utmost importance that this should be done right. Do not trust this to inexperienced parties, but send it at once to some reliable manufacturer of wood-working machinery who generally have experienced men and the best tools in their works for this purpose, and you will save time and expense.

How to Balance Knives.

All prominent Knife Manufacturers understand the importance of having each of the two-three or four knives of a set exactly the same length width and thickness, and if made properly will weigh the same. Now to be in balance they must be kept so by grinding the bevel. Do not chip off the heel or chip out the slot to make them weigh alike for they will not be a running balance if you should get a nic broke out of one of your knives; set that knife back the least trifle and it will not show on the board or grind them all down alike on the bevel.

A short time ago we were called to see what was the matter with a planer the parties claimed they could not do good work, the planer was new, had been in use but a few months and a fine machine, although it was not furnished by us. We threw off the Cylinder belts and examined the Head, a three sides, it was loose in the boxes; in examining the knives we found two of them with notches chipped between the slots on the heel. It seems they had broken a notch out of one knife and ground it out and chipped notches in the heels of the other two to make them weigh alike. It would simply be impossible to do good work with a machine in this condition.

How to Babbitt Pipe Boxes or Loose Pulleys.

To babbitt solid boxes or loose pulleys on the shafts they are intended to run on, be sure the box or pulley is free from water or dampness. Paint the shaft with white lead or smoke it with a coal oil lamp, or a good way is to wrap the shafts with paper, tying it on with thread, and when the babbitt is cool the shaft can be removed with ease, without these precautions it will be found difficult to remove the shaft from the box or pulley after the babbitt is cool.

How to cast the Boxes of a Planer Head at the Mill.

The Cylinder should not be used to cast the boxes with if it can possibly be avoided as in nine cases out of ten your Cylinder will be sprung in casting the boxes. A separate shaft should be kept for that purpose, either of iron or steel, (steel is best); which should be turned down each time your Cylinder is trued off, or a hardwood piece turned to the proper size will answer.

Chip the old babbitt out of the boxes, drill or chip out the anchor holes, wipe the same clean with dry waste, being careful to have the anchor holes clear, use nothing wet or damp around the boxes, heat a piece of iron and place on the boxes to warm them. Make two parallel pieces of wood, place one at each side on the bed of the planer, then place the shaft in the boxes and raise the bed or lower the boxes as the case may be, till the shaft is clear of the boxes, then secure the shaft by a weight or any other method to prevent its raising when the metal is being pored.

Stop the escape of metal at the ends of the boxes with a piece of leather slipped over the shaft, or putty or some waste, and secure it there.

Be careful in the selection of babbitt, do not use the cheap stuff called babbitt which floods the market, it may do for shafts running at a low rate of speed, but there is no end to the mischief it will cause when used for a Cylinder running from three to five thousand turns per minute.

Write to some responsible manufacturer of Wood-working Machinery and state for what purpose it is to be used, and you will get the genuine.

When genuine babbitt is offered for one half the cost of tin and copper, it is like offering genuine gold dollars at 50 cts. apiece.

Be sure your ladle contains babbitt enough to fill both boxes, heat the babbitt so it will show red when held away from the fire or away from the light; then pour the boxes as fast as possible, a good way is to use two ladles and pour one box at a time from both sides of the shaft.

After the two boxes are filled remove the shaft and dress off the edges of the babbitt.

Place the Cylinder in the boxes and turn it by hand, find out where it bears in the boxes, and proceed to scrape the boxes, removing and replacing the Cylinder until you find the shaft has a bearing all the way across the bottom and sides of the boxes; be sure the shaft does not come in contact with the iron.

Do not file the babbitt nor use emery cloth or sand paper, as the particles of grit will wash into the babbitt and spoil your shaft.

When the boxes are scraped down place your babbitting shaft back in the boxes, if the caps are long drill three holes in the top to pour the metal; get out packing strips to go between the cap and box, either of wood or several pieces of thin pasteboard; make holes through the packing strips for the bolts. Secure the ends so the metal will not escape and then proceed to pour the metal until the cap is filled. Then scrape the cap to a bearing same as the box and you will have no trouble with your cylinder, provided it and the knives and bolts are well balanced.

Once a day remove the belts from the Cylinder pulleys, try it at both ends by lifting it, if found to be loose in the boxes take off the caps and remove a thin strip of the pasteboard or plane down the wood packing; then screw the caps down tight, leaving the Cylinder so it can be turned easily by hand. No Machine can do good work unless the Head is taken care of properly.

General Hints Respecting the Manner of Fitting or Dressing Saws.

A saw tooth should have the proper spread and pitch for the wood which it is to cut. Soft wood requires more spread or "set," and less pitch; hard wood the reverse. A saw swaged full on both corners with square dress will do the fastest cutting, but requires the most power. In swaging use oil on point of tooth.

By careless dressing we have seen saw teeth higher back of the cutting point than at the point itself, thereby causing the saw to bind and heat on the rim.

The greater the feed the lower the back of the tooth should be, giving easier clearance and greater dust room.

In spreading the points of teeth it is almost impossible to make them all of equal width, but they may be reduced to a uniform width by the use of our Side File, which is illustrated on page

By this treatment the corners are stronger and less liable to break off in hard cuts.

THE EMERY WHEEL.

Emery wheels, as employed in gumming and sharpening saws, accomplish a great saving of time and labor, but when improperly used, as they often are, cause irreparable injury to saws. When the points of teeth become heated or "blued" by the use of an emery wheel, the steel loses its toughness and tenacity in some degree, and is liable to split and crumble off in the process of spreading the points afterward.

BAD FILING.

No saws are so liable to crack in using as circular cut-off saws, for the reason that they are generally filed so as to leave a square corner at the base of the teeth, and the bevel of the face being carried down into this corner, still further weakens it. Saws broken in this condition cannot be considered subject to our warranty.

It is surprising that so many still persist in this manner of filing, when a few strokes with a round file at the base of the tooth after beveling the front, will keep it in good shape by preventing the formation of the square corners from which the crack starts. The saw will clear better if the bevel is carried down only half the depth of the teeth.

Instructions For Re-Covering Iron Band Saw Wheels With Endless Rubber Tires.

Remove all dirt, grease, glue or cement from the face of the wheel with benzine or coal oil, using a sponge or a piece of cloth for the purpose; fasten the wheel firmly in a vise by the hub; mark the rubber band in four equal parts, also the wheel to correspond, with a piece of chalk, fasten the band to the wheel with a hand-screw at one of the chalk marks on both the wheel and band to correspond, stretch the band carefully on one side until the second chalk marks correspond and secure with the second hand-screw, then stretch the band on the opposite side of the wheel until the third chalk marks upon the band and wheel correspond and again fasten with a third hand-screw; the wheel will now be one-half covered, carefully stretch the remaining portion of the band over the wheel, in doing so, be careful that the band is not injured by coming in contact with the sharp corners of the wheel. Then take a round rod or roll of wood or iron, about one inch in diameter, and insert it between the rim of the wheel and band, passing it around the wheel and at the same time inserting the cement freely in the rear of the roll, both upon the face of the wheel and upon the rubber band. Be sure there is sufficient cement used until it gushes out at the edges of the band and wheel, then remove the rod or roll. Let the wheel remain in a dry place at least thirty-six hours before using, and when hardened trim off the surplus rubber and cement from the edges of the wheel and it is ready for use.

How to Take Care of Boilers.

BE SURE ALWAYS TO KEEP SOLID WATER up to the lower gauge cock, and in no case run with the water lower than that, or higher than the upper cock. You will, after a little experience, be able to regulate the pump by means of the cock in the waste pipe, that it will keep the water at the proper height in the boiler, and thus obviate the necessity of frequent attention to this point.

COLD WATER PUMPED INTO HOT BOILERS is very injurious, causing severe contraction of the seams and stays, which very often causes fracture of stays or leakage in the seams and tubes. Many boilers, well constructed and of good material, have been ruined by being blown out under a high pressure of steam, and then suddenly filled with cold water. This treatment is also highly productive of strained and leaky tubes, since being of thinner material than the shell, they cool and contract sooner.

IN CASES OF FOAMING, close the throttle, and keep closed long enough to show true level of water. If that level is sufficiently high, feeding and blowing out will usually suffice to correct the evil. In cases of violent foaming, caused by dirty water, or change from fresh to salt, or vice versa, in addition to the action before stated, check draft and cover fires with fresh coal.

IN CASE OF LOW WATER, immediately bank or cover the fires with ashes, or, if no ashes are at hand, use fresh coal, and close the draft. Don't turn on the feed under any circumstances, nor tamper with, or open the safety valve. Let the steam outlets remain as they are.

KEEP GAUGE COCKS CLEAR and in constant use. Do not open them too suddenly. Glass gauges should not be relied on altogether.

RAISE THE SAFETY VALVES cautiously and frequently, as they are liable to become fast in their seats, and useless for the purpose intended.

BLOW OFF THE BOILER about once a week, if muddy or "hard" water is used; once a month or two is sufficient for soft water. To do this, draw out all your fire; open the blow-off cock on the back end of the fire-box, leaving it so until the boiler is empty. Fill up again after the boiler is cool. Ten to twenty pounds of soda ash, dissolved in water and pumped into boiler four or five hours before blowing off, is beneficial where hard water containing carbonate of lime is used. "Hand-holes" are provided in suitable places to admit of scrapers for any further cleaning that may be necessary. Keep the ashes from under the grates, as this improves the draft, and prevents the grates from burning out; also keep the tubes clean, by brushing them out every day or so; the cleaner they are kept the less fuel will be required, and the easier it will be to make steam.

Horse Power.

One Horse-Power is the amount of power required to move 33,000 pounds one foot in one minute, or to move 550 pounds one foot in one second. It is equivalent to the power of eleven men.

TO CALCULATE THE HORSE-POWER OF ENGINES.

A=area of Piston in square inches.

S=No. of feet traveled by Piston per minute.

P=Mean pressure in pounds.

$A \times S \times P$

33,000=Number of Horse-Power.

TO CALCULATE THE HORSE-POWER OF A BOILER.

For Horizontal, Tubular and Flue Boilers—dividing the number of feet of heating surface by 15 will give the Horse-Power. For Locomotive Boilers use 12 as a divisor.

Power of Belting.

Horse-power of a belt equals velocity in feet per minute, multiplied by the width—the sum divided by 1000.

One inch single belt, moving at 1000 feet per minute=1 horse-power.

Double belts about 700 feet per minute, per 1 inch width=1 horse-power.

For double belts of great length, over large pulleys, allow about 500 feet per minute per 1 inch of width per horse-power.

Power should be communicated through the lower running side of a belt; the upper side to carry the slack.

Average breaking weight of a belt, 3-16 x 1 inch wide—Leather, 530 lbs.; 3-ply rubber, 600 pounds.

The strength of a belt increases directly as its width. The co-efficient of safety for a laced belt is—

Leather=1-16 breaking weight.

Rubber=1-8 “ “

TO FIND LENGTH OF BELTING, WHEN CLOSELY ROLLED.

The sum of the diameters of the roll and the eye in inches, multiplied by the number of turns made by the belt, and this product multiplied by the decimal .1309 will equal the length of the belt in feet.

Directions

FOR CALCULATING THE WIDTH OF BELTS REQUIRED FOR TRANSMITTING DIFFERENT NUMBERS OF HORSE-POWER.

The following calculations were predicated on the basis of allowing each square inch of belting in contact with the drum or pulley to raise half a pound one foot high in one minute, and the raising of 36,000 pounds, same height in same time as a horse-power.

By increasing the tension of the belt, much more than a half may be allowed to the square inch.

Multiply 36,000 by the number of horse-power; divide the amount by the number of feet the belt is to run per minute; divide the quotient by the number of feet or parts of a foot in length of belt contact with smaller drum or pulley; divide this last quotient by six, and the result is the required width of belt in inches.

EXAMPLE.—Required the width of belt, the velocity of which is 1,600 feet per minute, transmit 20 horse-power, the diameter of small drum being four feet.

36,000 multiplied by 20 = 720,000 divided by 1,600 = 450.

Diameter of smaller drum being four feet, the circumference over twelve feet, we will suppose the other drum so near and so large as to have but five feet of the smaller drum's circumference in contact with belt. The 450 divided by 5 = 90 divided by 6 = 15 inches, the required width of belt.

Side to Run Next the Pulley.

A Leather belt—grain side to the pulley—will do one third more work, and last one-third longer, than if flesh side to the pulley.

The smoother the two surfaces—that of the belt and that of the pulley—the greater the contact surfaces, and, consequently, the more power. The less air, also, will pass between them—the air preventing contact of belt and pulley. Want of contact is distinctly marked by dark impressions on the belt where it comes in contact with the pulley, and is noticeable on most new belts used with flesh side to pulley.

Belts used grain side to the pulley will not crack, as the strain is thrown on the flesh side in passing over the pulleys.

The strongest part of the leather is near the flesh side, about one-third way through from that side. It is therefore desirable to run the grain side next the pulley, in order that the strongest part of the belt may be subject to the least wear.

Cement for Leather Belting.

Take of common glue and American isinglass, equal parts; place them in a boiler and add water sufficient to cover the whole. Let it soak ten hours, then bring it to a boiling heat, and add pure tannin until the hole becomes ropy or appears like the white of eggs. Apply it warm. Buff the grain off the leather where it is cemented; rub the joint surfaces solidly together, let it dry a few hours, and it is ready for practical use; and if properly put together, it will not need riveting, as the cement is nearly of the same nature as the leather itself.

FASTENING BELTS.

Many good methods of fastening the ends of belts are in use; but lacing is generally used. It is flexible like the belt, and runs noiselessly over the pulley.

In punching a belt for lacing, use an oval punch, the long diameter of the punch being parallel with the sides of the belt. Punch two rows of holes in each end, placed zig-zag. In a 3-inch belt there should be four holes in each end—two in each row. In a 6-inch belt, seven holes, —four in the row nearest the end. A 10 inch belt should have nine holes. The edges of the holes should not come nearer than $\frac{1}{4}$ of an inch to the sides nor $\frac{1}{2}$ to the ends of the belt. The second row should be at least $1\frac{1}{4}$ inches from the end. On wide belts these distances should be even a little greater.

Begin to lace in the centre of the belt and take care to keep the ends exactly in line, and to lace both sides with equal tightness. The lacing should not be crossed on the side of the belt that runs next the pulley. In taking up belts observe the same rules as in putting on new ones.

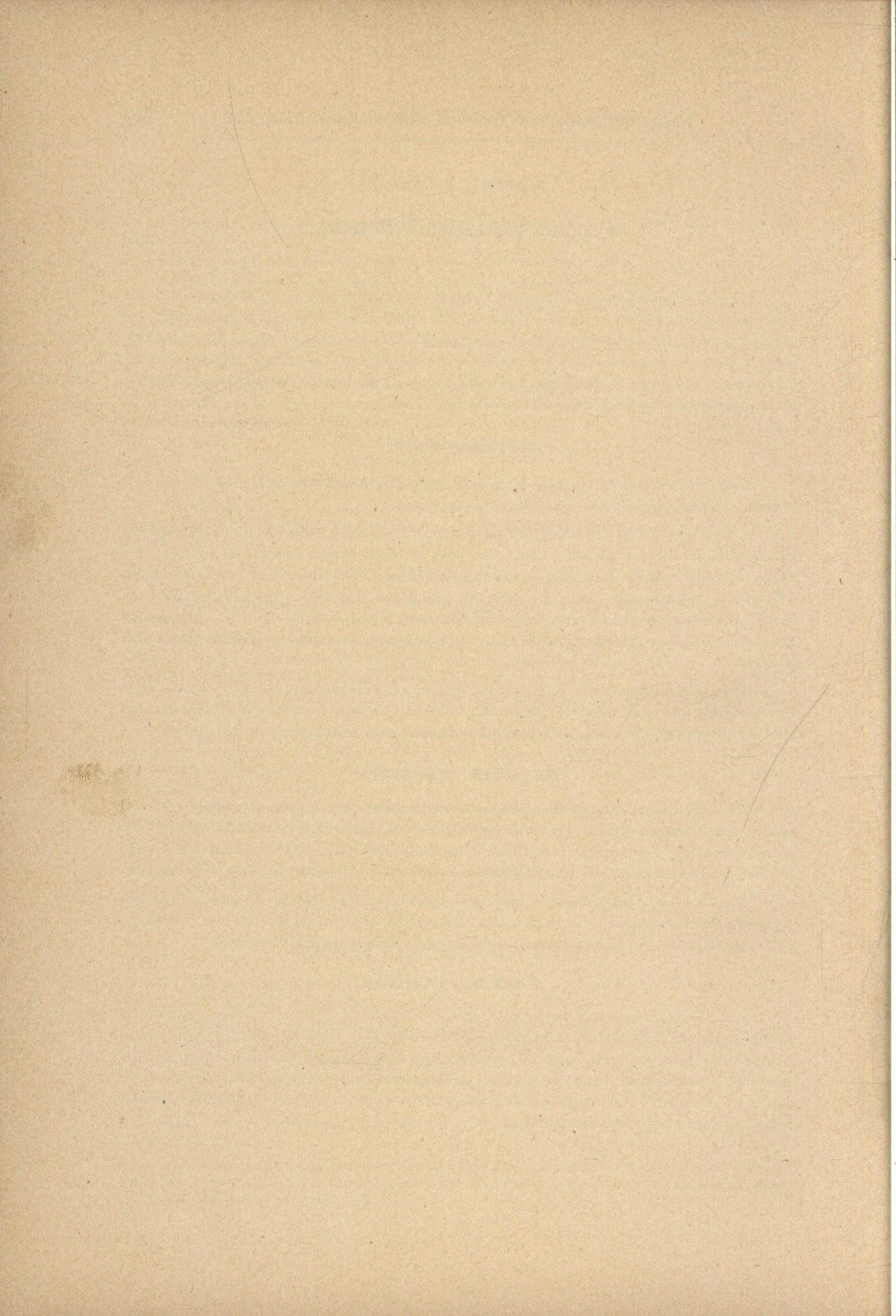
MEASURING FOR BELTS.

When convenient, measure the distance round the pulleys with a piece of marline or tarred rope (it will not stretch as a tape line or string will), and cut your belts, if it be butted, about $\frac{1}{2}$ inch short for every ten feet in length of marline; if endless, allow for lap. If the belts are to be made to order, send us the marline by mail or otherwise, and we will see that the belts are proper length.

When not convenient to measure the length round the pulleys, add the diameter of the two pulleys together, divide the result by two, and multiply the quotient by $3\frac{1}{2}$; add the product to twice the distance between the centres of the shaft, and you have the length required.

WHAT IS A CAR LOAD?

Nominally a car load is 20,000 pounds. It is also 50 barrels of salt, 70 barrels of lime, 90 barrels of flour, 18 to 20 head of cattle, 50 to 60 head of hogs, 80 to 100 head of sheep, 9000 feet of solid boards, 17,000 feet of siding, 13,000 feet of flooring, 40,000 shingles, 4,500 feet of hard lumber, 7,000 feet of green lumber, 8,000 feet of joists, scantling and all other large timbers, 340 bushels of wheat, 460 of corn, 680 of oats, 400 of barley, 360 of flaxseed, 360 of apples, 430 of Irish potatoes, 360 of sweet potatoes, 1,000 bushels of bran.



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